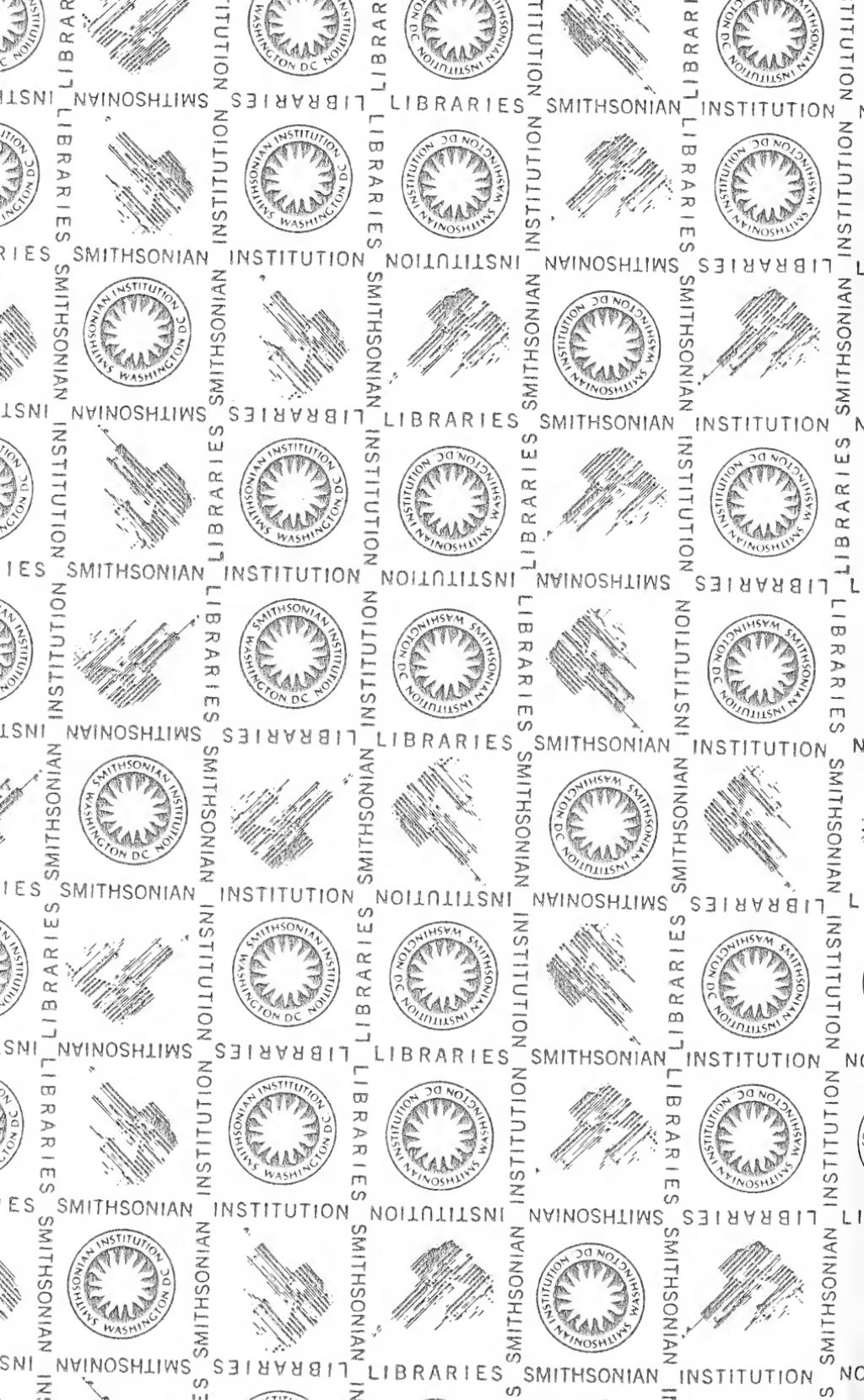
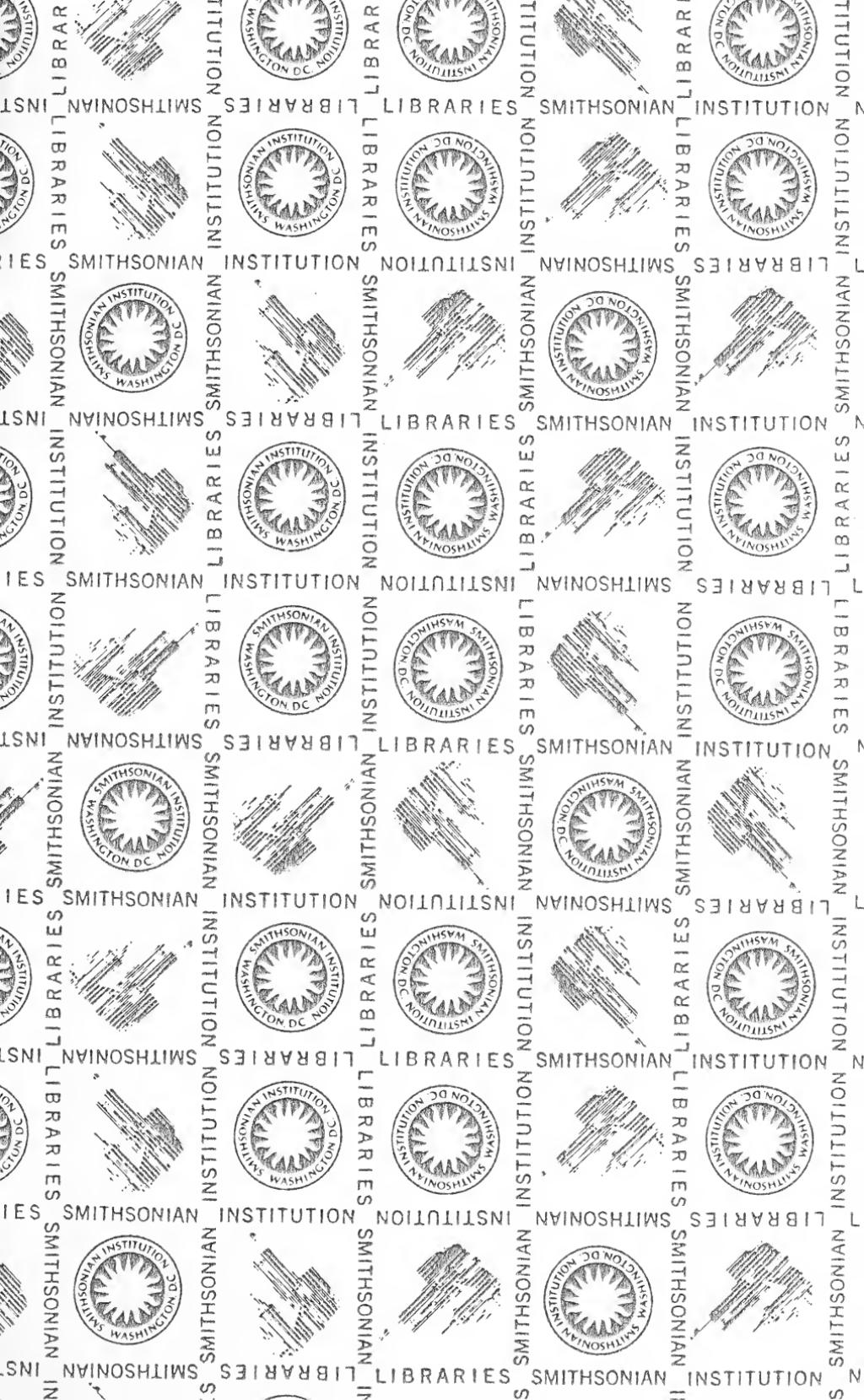


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Animal Keepers' Forum

JANUARY 1987



Dedicated to Professional Animal Care



Executive Editor: Alice Miser
Managing Editor: Susan Chan
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JANUARY 1987
VOLUME FOURTEEN
NUMBER ONE

Animal Keepers' Forum (ISSN 0164-9531) is a monthly journal of the American Association of Zoo Keepers, Inc., 635 Gage Blvd., Topeka, KS 66606. Five dollars of each membership fee goes toward the annual publication costs of *Animal Keepers' Forum*. Second Class postage paid at Topeka, KS. Postmaster: Please send address changes to:

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NATIONAL HEADQUARTERS, 635 GAGE BLVD., TOPEKA, KS 66606
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States West of the Mississippi - Debbera Stecher, Woodland Park Zoo, Seattle, W.
Individual Regional Coordinators and the states under their oversight are listed elsewhere in each issue of *Animal Keepers' Forum*.

Featured on this month's cover is a Blue-and-gold Macaw (*Ara ararauna*) drawn by Rose Palazzo of the Bronx Zoo, NY. Macaws are the largest of the nearly 300 members of the parrot family which inhabit the tropical regions of the world. A unique feature found in all parrots, but not in any other type of bird, is their ability to use their feet to bring food up to their mouths. Macaws are thought to mate for life and unlike many bird species, the macaw offspring may remain with their parents for quite a long time. Thanks, Rose!

Scoops and Scuttlebutt

AAZK BOARD APPOINTS PROJECT HEADS/COMMITTEE MEMBERS

The AAZK Board of Directors recently approved the appointment of Debbie Jackson, Little Rock Zoo, as the new project head for the Program Library. This position was previously held by Anne Payne of the Detroit Zoo who recently resigned.

The Board also has approved the following individuals to serve on the AAZK Awards Committee under Chairperson Rachel Rogers of Miami Metrozoo: Susan Bunn, Minnesota Zoological Gardens; Harry Hofauer, Metro Toronto Zoo and John Kiseda of the Bronx Zoo.

Please note also that it has been incorrectly listed on the front inside cover under Committee/Project Heads that Brint Spencer was Chairman of the Diet Notebook Project. While Brint is working on this committee, Susan Bunn is the Chairperson for the Diet Notebook Project. Our apologies for the error.

WINNIPEG CONFERENCE PATCHES AVAILABLE FROM NATIONAL HQ

The 12th National AAZK Conference '86 patches featuring the polar bear logo are available from National Headquarters in Topeka. They are white imprint on navy background and measure 3-3/4" by 2-3/4". Cost is \$2.50 (US) per patch. Make check or money order payable to AAZK National.

The 1986 AAZK Conference Committee in Winnipeg still has some conference T-shirts available for sale. The polar bear logo is printed in off-white on a navy blue shirt (50/50 poly-cotton blend). The cost is \$10.00 (US) per shirt and may be ordered through: Conference T-Shirts, 785 Buckingham Road, Winnipeg, Manitoba, Canada R3R 1C3. Checks or money orders for T-shirts should be made payable to: Assiniboine Park Zookeepers Association.

INFORMATION PACKETS AVAILABLE ON "FOUNDER'S WEEKEND" IN SAN DIEGO

The 20th Anniversary "Founder's Weekend" will be held in San Diego from 5-7 May, 1987. A special very limited edition anniversary T-shirt is being printed for the event. See details in December 1986 special edition AKF, page 358. To receive an information/registration packet, write to AAZK History Committee, c/o Art Goodrich, Mammal Dept., San Diego Zoo, Box 551, San Diego, CA 92112. AAZK is 20 years old - let's celebrate!

SCOOPS AND SCUTTLEBUTT, Continued

WOODLAND PARK ZOOLOGICAL GARDENS TO HOST SECOND WORKSHOP ON "APPLYING BEHAVIORAL RESEARCH TO ZOO ANIMAL MANAGEMENT"

The Woodland Park Zoological Gardens, Seattle, WA, will again host a national workshop titled "Applying Behavioral Research to Zoo Animal Management" with the assistance of an Institute of Museum Services Conservation Grant. The workshop will be held 18-25 July, 1987, and is especially directed at curatorial, veterinary, and keeper staff from zoos, aquariums, and related facilities. Through lectures, discussions, and actual short research projects, participants will learn skills to conduct their own behavioral studies and to apply the results to specific management problems (e.g. enclosure design, feeding procedures, breeding programs, and veterinary care). Additional activities include tours of Woodland Park Zoo, Point Defiance Zoo, Northwest Trek Wildlife Park, and the Seattle Aquarium.

The workshop will be organized and taught by Carolyn Crockett, Ph. D., University of Washington, Michael Hutchins, Ph.D., New York Zoological Society, and William Karesh, D.V.M., Woodland Park Zoological Gardens. Jill Mellen, Washington Park Zoo, and a nationally-known keynote speaker will give guest lectures.

Enrollment is limited to 40 participants. Registration fee for the 8-day workshop is \$80 if paid before 1 May and \$100 thereafter. Priority will be given to employees of zoos and related facilities. Registration prior to 1 May will be limited to two applicants per institution based on the order of receipt of pre-paid applications. Overflow applicants will be placed on a waiting list. University of Washington college credit can be obtained for an additional fee. For more information and a registration form write: William Karesh, D.V.M., Animal Health Department, Woodland Park Zoo, 5500 Phinney Ave. N., Seattle, WA 98103.

CHESAPEAKE WILDLIFE SANCTUARY SEEKS TO PLACE CRIPPLED WILDLIFE

The Chesapeake Wildlife Sanctuary, a non-profit, independent wildlife rehabilitation center in Bowie, MD (just 15 miles east of Washington, DC) continually has a number of permanently disabled wildlife patients which are available for placement. Possible species available are: Great Horned Owl, Red-tailed Hawk, Bald Eagle, Red-shouldered Hawk, Green Heron, Turkey and Black Vultures, various species of ducks, swans, geese, songbirds and raptors. Send a self-addressed, stamped envelope for more information to: Chesapeake Wildlife Sanctuary, Crippled Wildlife Placement Committee, 17308 Queen Anne Bridge Road, Bowie, MD 20716. Details on the specific requirements for institutions requesting crippled wildlife and an application form will be sent.

AAZPA WESTERN REGIONAL AND CALL FOR PAPERS

The Fresno Zoo is hosting the 1987 AAZPA Western Regional Conference from 5-7 April, 1987. The theme for the conference is "Basics Revisited".

We are encouraging topics concerning current, developing, or long-forgotten fundamentals which may remain as basics for the future, especially in animal husbandry. Please submit a title and a short abstract by 1 February, 1987. Contact us if you have any questions on papers or session scheduling: Scott Ransom, Assistant Zoo Director, or Sean McKeown, Curator of Reptiles, 894 W. Belmont Ave., Fresno, CA 93728, (209) 488-1480.



Coming Events

THE SECOND INTERNATIONAL SYMPOSIUM ON BREEDING BIRDS IN CAPTIVITY

Feb. 11-15, 1987

Universal City, CA

For information contact: I.F.C.A., 11300 Weddington St., North Hollywood, CA 91601 (818) 980-9818.

NORTHERN FOREST OWL SYMPOSIUM

Feb. 3-7, 1987

Winnipeg, Canada

For more information write: Coordinating Committee c/o Marlin W. Shoesmith, Box 14, 1495 St. James St., Winnipeg, Manitoba, Canada R3H 0W9.

6TH ANNUAL NATIONAL WILDLIFE REHABILITATORS ASSOC. SYMPOSIUM

March 15-17, 1987

Clearwater Beach, FL

For more information contact: Symposium Information, Suncoast Seabird Sanctuary, 18328 Gulf Blvd., Indian Shores, FL 33535 (813) 391-6211, Attn: Barb Suto.

GLAZA'S 8TH ANNUAL BOTANICAL & WILDLIFE ART SHOW

May 14-17, 1987

Los Angeles, CA

For more information contact: Patti Glover, GLAZA, 5333 Zoo Dr., Los Angeles, CA 90027-1498 (213) 664-1100.

10TH MEETING OF THE AMERICAN SOCIETY OF PRIMATOLOGISTS

June 13-16, 1987

Madison, WI

Hosted by the University of Wisconsin Regional Primate Research Center. To include paper sessions, symposia, posters, exhibits and business meetings. Deadline for abstracts is 1 March 1987. Arrangements for university housing are available. Contact the Research Center for details.

INTERNATIONAL CHILDREN'S ZOO SYMPOSIUM

July 1-4, 1987

Philadelphia, PA

Hosted by the Philadelphia Zoo. As we all know, keepers are essential for the successful learning experience of the casual visitor to a Children's Zoo. Keeper participation is also essential for a successful Children's Zoo Symposium. We would like keepers to present papers and participate in workshops during this symposium. The symposium will focus on History and Philosophy, Design and Learning, and Animal Collection and Purpose. There will be pre- and post-conference trips to the Bronx and Baltimore Zoos plus much more. Registration is \$100. For further information, contact: Robert Callahan, Curator of Children's Zoo, Philadelphia Zoo, 34th St. & Girard Ave., Philadelphia, PA 19104 (215) 243-1100 Ext. 300.



Births & Hatchings

Carol J. Boyd of the Milwaukee AAZK Chapter reports the following births at her facility: On 14 October, 1986, after an 11-year absence, the Milwaukee County zoo again experienced a Reticulated Giraffe birth. This birth was the 26th such birth at our Bluemound Road location. The female, Jennifer, from Calgary, was separated from the herd in anticipation of the birth, her first. As sometimes anticipated with first time mothers - there was the chance of Jennifer injuring or even killing the calf shortly upon birth, so separation from the herd and very frequent night checks were instituted. During one such early morning check it was discovered that Jennifer had gone into labor and given birth quickly, but as anticipated she became frightened and began kicking the calf. Injury was too extensive and the young, a female, died shortly afterwards. At this time Jennifer is back with the herd and is doing fine. We watch for any signs of breeding - we know Jennifer will be a good mother the second time around.

November was a special month in our Small Mammal Building. Our two female Bettong (Brush-tail Rat-kangaroo) each have a joey in their pouch - the first two of their kind born at our institution. These kangaroos are considered endangered in their native Australia. Our first surviving Goeldi Monkey was born on 23 November. The mother had failed to raise her two previous offspring. The parents are on loan from the Brookfield Zoo. November also saw the 10th birth to our Mountain Fruit Bat colony. We believe we are the only institution to exhibit these African bats. The colony now numbers 16 individuals.

Randy Walsh of the Zoo Atlanta AAZK Chapters reports the following: On 10 October, 1986, one of our Reeves muntjac gave birth to her first offspring at Zoo Atlanta. This was quite a surprise since she had been kept without a male since her arrival at our zoo several months ago. On 24 October, our Grant's Zebra, "Milia", gave birth to her 6th offspring in as many years.

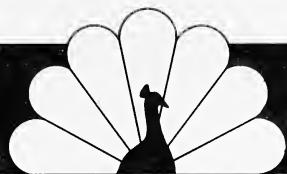
Ed Hansen of the Tucson AAZK Chapter reports as follows: On 10 November, 1986, the Reid Park Zoo in Tucson experienced our 4th captive birth of a second generation Giant Anteater (*Mymecophaga tridactyla*) at out institution. Overall, this is the 10th birth for this species at the zoo. The youngster is a healthy male and contentedly rides around on its mother's back, camouflaged perfectly from the potential photographer.

Sandy Voth of Busch Gardens/Tampa reported that the following species have been born at The Dark Continent during October-November: 1.0 Scimitar-horned oryx, 1.1 Sable Antelope and 1.1 Ugandan Kob.

Betty Jean Burcham of the Virginia Zoological Park AAZK Chapter reports the following: The Virginia Zoological Park at Norfolk is very happy to announce that their rock hyrax (*Procavia capensis*) are now reproducing in their indoor exhibit. 1.4 were born to their 10-year-old female on 8 April, 1986. All were still born except one female which unfortunately died on 18 May, 1986. On 16 October, 1986, however, 3.3 hyrax were born to a younger female and 2.1 survive as of this report.

Significant births and hatchings reported in the December AAZPZ Newsletter include: 0.1 white rhino at the Knoxville Zoo (the 12th since the herd was established in 1974); four litters of Virgin Island boas (*Epicrates monensis granti*) at the Toledo Zoo (two of the litters were captive-bred and believed to be the first such in any zoo); 1.0 Asian Elephant at the Tulsa Zoo on 5 October; 0.0.1 Chilean Flamingo at the Greater Baton Rouge Zoo (the first such hatching for this facility); and 0.0.1 Emperor Penguin chick hatched at Sea World in California, the only place outside the antarctic that this species have been bred.





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AAZK AWARD NOMINATIONS ARE NOW BEING ACCEPTED FOR 1987!

The AAZK Awards Committee would like to begin to accept nominations for the awards to be presented at the 1987 AAZK Conference in Milwaukee. In the following months there will be information concerning the qualifications, nominations procedure, selection procedure, and an explanation of the AAZK EXCELLENCE IN ZOOKEEPING (EZ), CERTIFICATE OF MERIT FOR ZOOKEEPER EDUCATION (CMZE), and the MERITORIOUS ACHIEVEMENT (MA) Awards.

The deadline for all award nominations is 1 JUNE 1987, so please keep this in mind when submitting your nominations. All awards given by AAZK have no minimum or maximum number offered each year, but if the nominees do not meet the qualifications and nominations procedure, they will not receive the award for which they were nominated. Please submit all nominations to:

Rachel Rogers, Chairperson
AAZK Awards Committee
METROZOO
12400 SW 152 Street
Miami, FL 33177

AAZK EXCELLENCE IN ZOOKEEPING AWARD

This award is given to keepers who go beyond what is considered average in the areas of dedication, commitment, and professionalism in the field of zookeeping. In fulfilling the animal's needs a keeper must have a knowledge of the animal's behavior, physiology, and natural history. This is the essential knowledge necessary for effectively maintaining a species in captivity. The excellent zookeeper must excell in one or more of these areas but not be lacking in any one of them.

Qualifications:

1. The nominee must be a full-time keeper, employed in any North American zoological institution or aquarium.
2. The nominee must have been employed at least one year on a permanent status at a zoo or aquarium.
3. The nominee must be nominated by his or her peers who have also been employed at that same zoo or aquarium. Supporting nominations may be submitted by management personnel in that same zoo or aquarium.

Nomination Procedure:

1. List name, position, institution, years of service in the field and the recommendation of peers or colleagues.
2. List outstanding achievements: exhibits, breeding, education, etc.
3. List any extra activities outside of zoo or aquarium work: working with conservation groups, youth, wildlife officials, etc.

Selection Procedure:

The Awards Committee, consisting of five keepers, will independently review each nominee.

AWARD DEADLINE 1 JUNE 1987

Next month: AAZK Certificate of Merit for Zookeeper Education



1987 State of the Association Report

By
Jean Hromadka, AAZK President

As we enter the dawn of a new year, we also mark the 20th Anniversary of the American Association of Zoo Keepers. Founder Dick Sweeney, along with six other San Diego zoo keepers, first established AAZK "...to promote and establish a means to stimulate incentive and create greater interest in the zoo keeper profession, and to exchange ideas and ideals beneficial to the field of animal care." Four of these original founders are presently still employed at the San Diego Zoo - Dick Sweeney, Animal Care Manager/ Mammals; Red Thomas, Senior Keeper; Dennis Melvin, Senior Keeper; and Ken Willingham who is also an Animal Care Manager for Mammals. Former keeper Conrad Grayson is now serving as deputy sheriff for the San Diego area. Former zoo keepers and two of the original founders, Carl Pyle and Walt Bromley, have both passed away.

The first AAZK chapter was chartered in San Diego on 5 December, 1967 with 29 keepers participating. Through the mail, keepers from all parts of North America were encouraged to become members of this fledgling organization. At first, keepers joined as affiliate members of the San Diego chapter, but then the Cincinnati Zoo and the Central Park Zoo (NY) founded chapters of their own. By the fall of 1968, the organization had grown to include 44 zoos and 25 states. During the same year, Dick Sweeney, AAZK's first National President, presented the Association to the American Association of Zoological Parks and Aquariums (AAZPA), which was meeting in Los Angeles. In his address to the AAZPA delegates, Mr. Sweeney not only asked that they endorse the AAZK organization but to be reassured that "...we keepers have a sincere desire to contribute our best to make our zoos successful."

Over the span of twenty years, the Association has demonstrated her stability through the consistent stages of growth that has enabled AAZK to continue to progress both in size and strength. At this time, over 2,000 individuals are members, with the membership increasing annually. Presently, over 175 North American zoos, animal parks and aquariums are represented, twelve of these facilities are located in Canada. Of course if you include the twenty-five zoological institutions abroad located in 14 different countries, one will discover that the AAZK organization is recognized of over 200 of the world's animal institutions.

The AAZK National Board of Directors for this year remains unaltered until 1988. Since the Board terms of Frank Kohn, Vice President; Oliver Claffey, Board Member; and myself as AAZK's National President are over at the close of 1987, we find ourselves in an important election year. Kerry Hoffman and Sue Barnard, who have just completed their first year as National Board Members, will continue to serve the remainder of their terms. The AAZK organization continues to grow and prosper primarily when the Board of Directors demonstrates a deep, personal commitment combined with the ability to work well as a team. Without that strong leadership present throughout the Association's history, many of AAZK's accomplishments would never have been made possible. Fortunately, the present Board Members mentioned above, along with Barbara Manspeaker and Susan Chan who work out of National Headquarters in Topeka, all are hard-working professionals who devote countless hours and energy into AAZK's ongoing projects. Totaling close to forty individual committees and projects, many concerned AAZK members are called upon to help these important projects to a successful conclusion.

The various AAZK projects and committees are the primary avenue for any interested member wanting to contribute towards the goals set by the Association. As stated in our constitution, we strive "to promote good relationships among professional zoo keepers; to promote and establish a means to stimulate incentive and create greater interest in the zoo keeping profession; to promote a brotherhood with members of the profession through projects that will strengthen the zoo keeper's job knowledge. To support and publicize our concern for all valid and deserving projects of conservation and to do our part in educating the general public to the need for worthwhile projects of preserving our natural resources and animal life." Through our monthly publication, Animal Keepers' Forum, those wishing to learn more about the organization's activities and available benefits can find all the necessary information in specific issues. The Editorial Staff at Topeka continue to produce an excellent magazine for our membership with articles submitted predominantly by keepers as well as from other sources connected with the animal care profession. We should also be especially grateful to Susan Chan, Alice Miser and Ron Ringer for their time and patience when editing our articles before sending them to the printers. Keep in mind that this publication accomplishes one of AAZK's primary goals by opening up channels of communication between zoo keepers all over the world. Uniting animal people through the exchange of information yields many positive achievements. Two other publications offered by the Association are Zoonotic Diseases and Biological Values II. The first booklet mentioned deals with common zoonotic diseases and includes guidelines for preventive control as well as tips on personal hygiene and disinfection procedures. Biological Values II is a notebook containing biological data on 441 mammal species. Recently both publications were added to Wildlife Publication's book list because of their popularity and resource value. The Zookeeping As a Career brochure continues to educate the general public about AAZK and the role of the professional zoo keeper. More and more requests have been received, especially from the personnel departments in a variety of zoological institutions and from career-guidance counselors at academic facilities.

The International Affairs Committee was established to assist us in maintaining close ties with our sister Keeper Associations found in Australia, Great Britain, Japan, the Netherlands and China. Since we attract more and more international members each year, we found it necessary to establish two coordinators for this committee. Pam McDougall, Calgary Zoo, is coordinator for the west which covers both Asia and Australia. Melba Shields, National Zoo, is the eastern coordinator responsible for international members in Europe, Africa, the Mideast and Central and South America. Through recent correspondence made with concerned individuals working with zoos and the staffs of zoos in third world countries, the need for a sponsorship program was realized. Under the Sponsorship Program, AAZK seeks out AAZK Chapters or individual members to "adopt" an animal person working in a third world zoo by paying for their international membership fee in AAZK as well as providing the adoptee with educational tools to enhance their career in the zoo field. Thanks to Ms. Sally Walker in India, six Indian keepers have been sponsored. Several sponsorships for individuals in Central America are currently being arranged. Since there has been such an overwhelming response from our membership to the sponsorship program, we have decided to make this option available to any international keeper working for zoos in countries where pay is low and conditions are below standards.

The Keeper Accommodation List (KAL) continues to provide members who plan to travel here at home and abroad, a list of contacts to approach before arriving at their various destinations whereby arrangements can be made to stay in the area either free or for a minimal fee. Not only can a

traveling keeper save money, but also gets a better introduction to the animal facilities in the area. Of course, the new friendships established usually make the visit that much more enjoyable and educational. Any member may request the names of these contact people for specific areas by writing to the Metro Toronto AAZK Chapter. The Membership Directory lists the names of the Association's membership along with zoo affiliation and individual areas of interest. Through the efforts of Patricia Sammarco at Lincoln Park, each year this booklet is made available to all members.

The formation of AAZK Chapters increases each year which helps strengthen our organization in many different ways. Not only does the membership increase in numbers, but the activity level in National projects by member keepers also increases. AAZK Chapters provide keepers the opportunity to share information and to help contribute towards the goals set by the Association on a local level. Presently we find ourselves with over 60 individual chapters. There are times when local chapters need assistance and/or guidance from National. Since we felt the responsibility to adequately assist all these chapters at the same time was too great for one member (Chapter Affairs Coordinator), we recognized the need to appoint someone locally. This year I introduced the idea of each chapter selecting their own Chapter Liaison. So that each liaison will be able to perform their duties confidently, a Chapter Liaison Packet has been prepared which briefly describes everything that comprises the AAZK organization. This Chapter Liaison will act as a link between the local chapter and the parent organization. Most of us are fully aware of the many valuable contributions made by enthusiastic chapters but at times appear to go unnoticed. Hopefully through the closer ties established between National and our Chapter Liaisons, we will find ourselves with more productive, better informed members.

The Regional Coordinator System steadily progresses with each passing year. The program was originally created to circulate the existence of the AAZK organization and the benefits that she offered her members. Under the direction of two strong Regional Coordinator Heads, Diane Krug and Debbera Stecher, this system has undergone many positive alterations. With the phasing out of the Chapter Affairs Coordinator, the middle-man has been eliminated providing more responsibilities to the regional coordinators assigned to certain regions. Between the local chapter liaisons and the RC's appointed to a specific area, the Regional Coordinator Heads will be able to keep National abreast of all chapter activity. Of course, the regional coordinators will continue to encourage the formation of new chapters, suggest ways for a member or a chapter to become more actively involved in National projects or just prevent chapters from eventually stagnating due to lack of interest.

Some of our most productive AAZK projects originated and are still under the supervision of the Keeper Education Committee coordinated by Pat Sammarco. Many of these committees have evolved enough to stand on their own and remain fruitful under the watchful eye of a strong chairperson appointed by the Committee. One major concern of the KEC is to make sure that a committee does not duplicate the efforts of another already established committee or project. This is one of the reasons for the establishment of the AAZK/AAZPA Liaison, a position held by Brandy Pound of the San Francisco Zoo. Through her guidance both organizations compliment each other rather than duplicate efforts. We are also allowed access to the International Zoo Educators and the Zoo Librarians' Special Interest Group through her influence. Some new ideas currently being introduced to the membership as they develop into substantial projects include the Churchman proposal and the CAUZ network. The Churchman proposal was introduced by

Mr. Churchman, a curriculum writer, when he agreed to assist the AAZK organization in writing a Keeper Training Workshop. The objective of this proposal is to offer this course to keepers through workshops scheduled over all of North America. Presently, the Board of Directors has decided to pursue this proposal more aggressively as soon as Mr. Churchman has time to appear before the Board at the next AAZK conference. The CAUZ network was founded by Donna Fitzroy Hardy, Ph.D., from California State University, Northridge, during the Spring of 1985. The Consortium of Aquariums, Universities and Zoos (CAUZ) main function is to serve as a communications link between zoos, aquarium and university students, keepers, scientists and educators. More information on this network will be made available to all members through a series of articles to be published in upcoming issues of AKF. Anyone interested in locating institutions that offer classes or courses directly related to captive wild animal care can utilize the Zoo/University List. This list may be obtained by sending a 39¢, stamped, self-addressed, legal-sized envelope to National Headquarters in Topeka. Recently we have discovered that the Reference Search and Library Resources committees share similar responsibilities. In the future you may see these two projects combine their efforts to function as one committee. The Library Resources Committee, headed by Kaci Thompson, aids keepers in locating printed materials as well as offers information on how to utilize libraries more efficiently. This committee has also established a close link with the AAZPA Librarians' Special Interest Group which has led them to work jointly in many areas. Just to mention one of the many advantages brought about because of these cooperative efforts, a Bibliography Coordinator has been appointed to collect and distribute bibliographies on zoo-related topics free of charge to those requesting them. The book, An Approach to Zoo Keeping, compiled by co-editor Pat Sammarco and many other AAZK members is finally reaching the rough draft stage. This text will attempt to present basic concepts, attitudes and techniques involving the zoo keeping profession. The Keeper Training Materials Identification Project identifies various materials in use at animal facilities for training and secures permission to list their availability to those connected to the zoo profession. The goal is to help zoos improve and formalize their training programs and to offer the opportunity for self-improvement to all those active in the animal care field. Coordinator of this project is Laura Trechsel, Folsom Zoo with Rosemary Jalink, Mill Mountain Zoo, as newly appointed project head. This committee will remain under the guidance of the KEC which is in the process of forming a review committee to examine video tape resources used for keeper training. The Program Library has been recently assigned to Debbie Jackson, Little Rock Zoo. This project is responsible for collecting programs (scripts, slides, video tapes, etc) and for making them available to chapters for a small rental fee. These programs were produced by keepers who presented papers at animal-related conferences. The Video Tape Project under Wayne Buchanan of the Woodland Park Zoo continues to successfully market two keeper produced programs: "Zoo Keeper Safety: An Attitude Adjustment", and "A Zoo Keeper's Introduction to Feeds and Feeding". This project was created to encourage keepers to produce their own video tape programs about the zoo keeping profession. A new video tape program entitled "The Keeper's Role in Zoo Animal Health" proposed by Judie Steenberg has been approved. The Staff Exchange project under Elandra Aum, WPZ, promotes keeper exchanges as a tool for on-the-job training. Presently, 52 institutions have agreed to participate in the exchange program following the terms set down by their own individual zoological institutions. Kathy Sucharitakul, Akron Zoo, is now supervising the Book Review Committee. This project solicits volunteers to review animal-related books and write articles about the work for AKF. The Membership Services Brochure has been temporarily put on hold until

1987 AAZK STATE OF THE ASSOCIATION REPORT, Continued

a computer is installed at National Headquarters. This brochure will list all of AAZK's projects and committees along with a brief description of each. Regular articles in the Forum remind members of the Association's activities. Those projects linked with keeper education can be found under the Continuing Keeper Education Column. There is also a special section which discusses safety tips and procedures under the THINK Safety Column.

The Research Grants Committee was developed to encourage keepers to conduct their own research projects and to make available the necessary funds to carry out this research. Two \$500 grants are made available each year to professional members who wish to submit their project to this committee for their review. A new application form has been adopted along with the development of a formal grant process which clarifies the sequence of events in grant submission, review and completion. Only one study was accepted for funding this past year - "An Investigation of the Effects of Bacterial Contamination on the Fertility and Hatchability of Black Ducks" being conducted by Steven Leathery from National Zoo.

Two forms available to AAZK members which help enhance the zoo keeping profession are the Animal Data Transfer Form and the Exhibit Design Form. Bernie Feldman will send the ADT Forms free to anyone requesting them. This form allows keepers to communicate specific animal care techniques along with any other pertinent information regarding an animal being shipped from their institution to another. Presently over 120 animal facilities are using this form. The Exhibit Design Form was created to help those planning to revamp an old exhibit or build a new one by providing suggestions to keep in mind that make up a well-constructed exhibit as well as those bad practices which should be avoided. This project is coordinated by Diane Forsyth at the Akron Zoo.

We have two notebooks that still require continuous feedback from the membership before they can be considered anywhere near completion. The Diet Notebook, now headed by Susan Bunn at Minnesota, was established to collect diet information for captive exotic animals to be made available in a loose-leaf notebook format. The Infant Development Notebook is collecting data on mother-reared animals. This project is under the supervision of Steven Wing at Milwaukee.

Through the Public Education Committee, we try to educate the public about the importance of today's zoos and the role we play as professional zoo keepers. Major changes will not come about for plant and animal species and their natural habitats until the general public is persuaded to change their old ways of thinking. Headed by Jay Jasan, Staten Island Zoo, this committee functions to explore, define and promote the role of keepers in formal education programs for the public. Jay is presently conducting a survey which will compile a resource to be used by those interested in conducting educational programs for the public. He is also trying to design a poster that will be used to educate the public about the zoo keeping profession. Ellen Bradfield, Zoo Atlanta, is submitting a regular column to AKF that will publish questions frequently asked by the public with the best answers submitted printed in a following issue. We are also hoping to produce a video tape entitled "Zookeeping As A Career" through a PBS station. This effort is being coordinated through Joanie Stinson at the Brookfield Zoo. The Public Relations Liaison acts as an aid to AAZK's Administrative Secretary, Barbara Manspeaker. Tim Kurkowski, Zoo Atlanta, who was appointed to this position, takes the time to answer letters concerning careers in zoo keeping from the standpoint of an experienced, professional zoo keeper.

1987 AAZK STATE OF THE ASSOCIATION REPORT, *Continued*

The Legislative Advisor, a position currently held by Becky Rogers, Topeka Zoo, is responsible for informing the membership via AKF on legislation relevant to the animal care profession and provide conservation updates. She also contacts legislators and conservation organizations on behalf of the AAZK organization. Through our Awards Committee we offer recognition to keepers for their outstanding professional achievement, service and educational programs. It was recently decided that only professional members be allowed to serve on this committee. David Thomas, Washington Park Zoo, and Phil Pennock, Woodland Park Zoo, were awarded the Excellence in Zookeeping awards at the 1986 National AAZK Conference in Winnipeg. Tracy Miller, formerly of the Buffalo Zoo, received the Meritorious Achievement Award. Two new committee members have been appointed as requested by chairwoman Rachel Rogers. Harry Hofauer, Toronto Zoo, and John Kiseda, Bronx Zoo, are the new Award Committee members. It was also suggested that those keepers receiving AAZK awards be presented to AAZPA for publication in their newsletter.

The Nomination/Election Committee under the direction of chairwoman Jan McCoy, Washington Park Zoo, has undergone some positive changes. First of all, the nominee forms were improved, more time was scheduled to prepare the membership for an election year, and it was decided that anyone serving on this committee was not eligible to be nominated or run for a National Board position.

The AAZK History Committee chaired by Art Goodrich from the San Diego Zoo, is responsible for compiling the AAZK organization's history. Since 1987 mark's AAZK's 20th Anniversary, a "Founder's Weekend" has been planned. Honoring the seven San Diego keepers who started AAZK, this special "weekend" will be held at the San Diego Zoo and Wild Animal Park over the 6th and 7th of May 1987. A post-conference tour is planned at Sea World on May 8th. This event is being planned entirely through the History Committee in order to honor the original founders and celebrate AAZK's 20th year. All chapters are encouraged to raise funds to be used to pay for the recognition gifts planned for the founders. We hope to be able to take care of their travel expenses so that they may attend the 1987 National AAZK Conference in Milwaukee where the 20th Anniversary celebration will continue. The Annual Conference report was submitted by Steve Wing from the Milwaukee County Zoo. The 1987 National AAZK Conference will be held in Milwaukee, WI from October 3-8 at the Sheraton Mayfair Hotel. The Conference Book Committee supervised by Phil Pennock offers guidelines for those thinking about hosting a regional or national conference. We hope to make this book available to the membership very shortly.

There are many chapters marketing items bearing the AAZK rhino logo. The AAZK Stickers are being handled by Rosemary Jalink at the Mill Mountain Zoo; the AAZK T-Shirts by Janet Meade at Little Rock Zoo; AAZK Belt Buckles in two sizes by Terri Schuerman of the San Diego Wild Animal Park; the AAZK Coffee Mugs by Steven Wing of Milwaukee County Zoo; the AAZK License Plates through Linda Anstanding of the Detroit Zoo; and the AAZK Baseball Caps by the Zoo Atlanta Chapter. The Keeper Care Buttons will once again be made available at the start of 1987 through Larry Sammarco at Lincoln Park Zoo. Because of the confusion with National By-law - Article VII, Section 10 concerning the profit split, it was decided to amend this by-law and have the membership present at Winnipeg vote on the change. The change was approved and this portion of the By-laws now reads: "Allocation of funds - any funds generated by a National conference which remain after costs will be split equally by the host chapter and the National Association. Any chapter project which uses the AAZK rhino logo and/or is marketed nationally must receive prior approval from the

1987 AAZK STATE OF THE ASSOCIATION REPORT, Continued

Board of Directors. Any chapter project which is identified with the National Association by name or logo and is marketed on a national basis must receive prior approval from the Board of Directors. All profits made on such products previously approved by the Board of Directors must be split equally between the chapter and the National Association. Chapter products not using the AAZK rhino logo may be marketed at any animal-related conference or workshop without any split of profits."

Those proposals discussed at the 1986 AAZK National Conference at Winnipeg covered a wide range of topics. First of all, National Headquarters in Topeka will have a computer system installed as soon as the proper system is selected. Both President Jean Hromadka and Vice-President Frank Kohn will travel to Topeka to help make the final choice. Instead of forming an Ethics Committee, an Ad Hoc Committee would be designated by the Board if the situation arises to warrant such a committee. The Board approved the Trimble Video Company to videotape the paper sessions at the 1986 National Conference in Winnipeg. Due to technical difficulties, the taping proved to be unsuccessful. It may be tried again at a future conference. Mark de Denus' game "Zooquest" won Board approval to use the AAZK logo and endorsement for the front cover of the game. In exchange, an AAZK membership brochure will be enclosed in each box of this animal-related game. We plan to find some individual to write grant proposals in an effort to locate additional funds for the Association. The registration fees for the National AAZK Conference will be paid for all active National Board Members. At the General Membership Meeting, the Tucson Chapter received approval to host the 1988 National Conference. Finally, we plan to redesign the National AAZK letterhead this year.

Once again the AAZK organization has taken many important strides during the year of 1986. Thanks to the many hard-working, dedicated AAZK members who actively participate in the organization.



FRESNO'S FAVORITE ELEPHANT
CELEBRATES 40TH BIRTHDAY

By
Mary L. Swanson
Zookeeper II, Fresno Zoo
Fresno, CA

Everyone's favorite animal in California's San Joaquin Valley is "Nosey", an Asian elephant. At the age of three years, she was purchased with the nickels and dimes of school children from all over the valley. The price of \$3,000 was a huge sum for children to raise in 1949. She was named through a children's naming contest. Thousands of people watched her walk to the zoo from the railroad station. So she has a very special place in the hearts of the people of the Fresno area.

She spent the next 33 years alone in a small, concrete-floored enclosure. After a long struggle to obtain the necessary building funds, we were finally able to put her in a spacious new exhibit with dirt, rocks, a tree, a pool and waterfall, and---best of all---provide her the companionship of three young elephants.

This fall she reached the milestone of age 40 years. So the zoo held a very special birthday party for her on 15 October, 1986. We also celebrated the zoo's 80th anniversary. The resulting "Zoobilee" was a fun party with balloons and birthday cake for all. Nosey's birthday "cake" was a 100 lb pumpkin decorated with raisins and other goodies. She shared a wheelbarrow full of melons and grapes with our other female elephants, Shaunzi and Kara.

The highlight of the evening was supposed to be weighing Nosey for the first time ever. There was even a weight guessing contest. But, as one wag put it, "No lady of 40 wants to reveal her weight to all the world."

Because Nosey is an elephant who never had training until the age of 36, it is hard for her to learn a task as difficult as being weighed. Her first formal training began in 1982, when Paul Barkman joined our staff. Because of her long social isolation from other elephants and her cramped quarters, it was difficult for her to adjust to a training routine. But with great patience, Paul taught her basic commands. We were finally able to properly care for her feet, move her in and out of night quarters readily, and turn this huge pachyderm into the matriarch of our herd of four elephants. She obviously enjoys life more now.

Nosey is a large, stocky elephant, who stands 8'2" tall at the shouder. In order to attempt to weigh her, many weeks before the party we started training her to stand still with a small board slipped under each foot. The California Highway Patrol was providing the use of their portable truck scales for the official weigh-in. These scales consist of four separate platforms, about 2' x 1½' x 2' high, each with a digital read-out. The resulting four readings are added up for a total weight. Balancing on these platforms can be a frightening experience for a relatively untrained elephant.

So every day she practiced standing on the plywood boards cut to the same dimensions as the real scales. It required the efforts of several people. One did the commands and the foot placing, one bribed her with pieces of apple as a reward, and two to three others placed the boards under each foot. By the time of the appointed evening, Nosey was standing quietly on the boards for up to three minutes.

FRESNO'S FAVORITE ELEPHANT CELEBRATES 40TH BIRTHDAY, Continued

But the night of the party was a different story. Nosey was not used to performing before huge crowds. It got darker faster than anticipated, balloons were popping, and cameras lights were glaring. It was all a little too scary for her and she balked completely.

The next day, at the time of day she had been practicing, and in the presence of only her keepers and the highway patrolman, we tried again. It wasn't easy! We had to slide each 80 lb. scale under a foot and, every-time she shifted off, move the scales under her feet again. She kept leaning over and one scale would read 5000 lbs. while the opposite one read 1100 lbs. Getting her to balance was tricky. At last, after nearly 30 minutes, we finally got a pretty good balance--just as she reached the end of her patience.

The monumental task was accomplished through the efforts of Paul Barkman, head trainer; zookeepers Paula Swanson, Kimberley Cook, Betty Barkman, and Mary Swanson, and Officer Fred Rylee of the California Highway Patrol.

Nosey's weight turned out to be 10,650 pounds. We believe this is a record for a female Asian elephant.



Chapter News

TUCSON AAZK CHAPTER

On 5 November 1986, approximately 15 keepers from the Phoenix Zoo traveled 120 miles to Tucson for our monthly Chapter meeting. They toured the Reid Park Zoo, and then adjourned to the staff area to exchange keeper anecdotes and info over burnt hotdogs and cold beer. While the Arizona Chapter of AAZK, located in the Phoenix area, has been inactive for a few years, the keepers from Phoenix seem to have the interest and enthusiasm to make the Arizona Chapter of AAZK vital and breathing once again. This historic meeting meant that about 80% of the Zookeeper population for the state of Arizona was together in one spot (scary thought!). It was an interesting and informative meeting, one that the Tucson Chapter hopes will be repeated often.

---Ed Hansen

ANNOUNCING THE FORMATION OF THE GREATER SAN FRANCISCO BAY AREA AAZK CHAPTER

Members of the Greater San Francisco Bay Area Chapter of the American Association of Zoo Keepers are proud to announce the formation of their chapter. This has been a cooperative effort involving the several Bay Area zoos, as well as other animal care facilities. We have chapter members affiliated with the San Francisco Zoo, Oakland (Knowland) Zoo, Sacramento Zoo, San Jose Zoo, Marine World/Africa U.S.A., Ano Nuevo Interpretive Association, The Preserve, and Unicorn Hollow.

Our elected officers are:

Pres...Norman Gershenson (S.F. Zoo)
V.P....Leslie Field (Sacramento Zoo)
Sec'y..Gale Buhlert (S.F. Zoo)
Treas..Leo Foster (S.F. Zoo)
Board Rep..Larry Brainard (S.F. Zoo)

The first Chapter project was a membership drive, and we now have 108 members. We look forward to establishing an enthusiastic and active membership that will contribute on the national, regional and local levels.

---Elisabeth Ryan
Chairperson, Publications

CHAPTER NEWS, Continued

IMPORTANT REMINDER TO ALL AAZK CHAPTERS!!!!

During the early part of November, a Chapter Information Request Form was sent out by National Headquarters to all Chapters for which we have a card on file. These included both active and inactive Chapters. Thus far we have heard from only a handful.

It is VERY important that these forms be filled out and returned to National HQ as the information is needed to assist us in setting up the new Chapter Affairs system under the Regional Coordinator Co-Directors. We are working hard to make the system work more efficiently and respond more quickly to the needs of all AAZK Chapters. Even if your Chapter has been inactive for some time, please take

the time to fill out and return the form. We want to assist all Chapters interested in rechartering. We would especially appreciate it if you would appoint a Chapter Liaison. This individual, as outlined in President Jean Hromadka's "Letter to Chapters" (July 1986 AKF, page 198) will serve as an important informational link between their Chapter and National AAZK. A Chapter Liaison Packet is currently being prepared which will be sent to all Chapter Liaisons. It will contain information on all National AAZK Projects and Committees.

So PLEASE, if you have not sent in your form, do so today. If you have lost or misplaced the form, drop us a card and we will be glad to send you another. Your swift cooperation is greatly appreciated!



NIXON GRIFFIS FUND ANNOUNCES SIX GRANT AWARDS

The Nixon Griffis Fund for Zoological Research (NGFZR), established in 1984 by New York Zoological Society Trustee Nixon Griffis, recently awarded six research grants. The recipients were:

Nancy Czekala, San Diego Zoo: "Fertility Evaluation in Male Gorillas by Urinary Hormone Analysis".

Mary Densmore, Ph.D., Texas A&M University, Terry Blasdel, DVM, Houston Zoo, and Duane C. Kraemer, DVM, Ph.D., Texas A&M University: "Effect of Etorphine and Xylazine on Fertilization Rates in Sheep".

Ellen Dierenfeld, Ph.D., New York Zoological Society, and Fred Koontz, Ph.D., New York Zoological Society: "Food Intake and Digestive Efficiency of the Proboscis Monkey (*Nasalis larvatus*) in Captivity".

Murray E. Fowler, DVM, University of California: "Evaluation of Ovarian Function and Conception in the Llama (*Lama glama*) Through Urinary Estrogen Conjugates and Progesterone Metabolites".

Bonnie L. Raphael, DVM, Dallas Zoo: "Interspecific Embryo Transfer in the Giraffe (*Giraffa camelopardalis*) and Its Direct Application to the Okapi (*Okapia johnstoni*) for Perpetuation in Captivity".

Gabriella A. Varga, Ph.D., and Brigitte A. Taylor, The Pennsylvania State University: "Colostrum, Gross Milk Composition, and Suckling Behavior of Captive Blue Duikers (*Cephalophus monticola*)".

Nixon Griffis Fund for Zoological Research grants are available to members of the zoo and aquarium community. Fund recipients may be keepers, curators, veterinarians, or research and consulting biologists. Grants, not to exceed \$3,000, are awarded semi-annually. Closing periods are 1 January and 1 July. For information about the Fund and grant application procedure, contact John Behler, Coordinator, Nixon Griffis Fund for Zoological Research c/o New York Zoological Society, Bronx, NY 10460.



Dr. Birute Galdikas To Lecture
At Metrozoo in March

The Education Department of the Zoological Society of Florida is pleased to announce a very special guest lecture by world renowned primatologist, Birute Galdikas. Dr. Galdikas, regarded as an authority on wild orangutans, spends six months a year conducting research and introducing hand-reared orangs to natural habitat. The remaining six months she teaches at Simon Fraser University in Vancouver, Canada.

Her lecture is given through the cooperation of the L.S.B. Leaky Foundation. The lecture is scheduled for Sunday, 15 March at 7:30 p.m. Participants will have an opportunity to meet Dr. Galdikas at a reception following her talk.

Visiting zookeepers will be charged \$8.00/lecture only and \$10.00/lecture and reception by showing their AAZK membership cards. All others will be charged \$12.00/lecture and \$15.00/lecture plus reception. The South Florida AAZK Chapter can provide keeper accommodations for those who need them by contacting Rachel Rogers, KAL Representative, at 12400 S.W. 152 Street, Miami, FL 33177 (305) 251-0403 by 1 March 1987. Register below:

Participants name _____

Address _____

City _____ State _____ Zip _____ Phone () _____

Mastercard Visa American Express Expiration date _____

Signature _____ Fee \$ _____ *

Mail To:
Education Department
Zoological Society of Florida
12400 S.W. 152 Street
Miami, FL 33177
(305) 255-5551

*A non-refundable \$5 processing fee will be retained in the event of a cancellation. Reservation by credit card may be made by phoning a Mastercard, Visa, or American Express card number to the Education Dept.



Dr. Galdikas with one of the hand-reared orangs prior to release.
(Photo credit: Rod Brindamour -
© National Geographic Society)



E L E C T I O N . . . '87

LAST CALL FOR NOMINATIONS FOR THE 1987 AAZK BOARD OF DIRECTORS! Three AAZK Board seats are up for election. We need nominations of persons you would like to have serving as board members. New board members will serve from 1 January, 1988 through 31 December, 1991. Nomination forms are due by 31 January, 1987, and are to be sent to the NEC Chairman, Janet McCoy (address below).

DUTIES OF THE BOARD OF DIRECTORS

For a more detailed explanation of the expanded duties of the Board, refer to the Papers of Incorporation - available upon request from National.

- 1) Select, appoint or remove officers, committees, agents and employees of the Association, including - prescribing powers and duties.
- 2) To control and manage the Association and its property, passing upon acquisition and disbursements with approval of a majority of the Board.
- 3) To formulate policies, rules and regulations in accord with the Constitution and By-Laws.
- 4) To uphold the Constitution of AAZK and the policies of the Association.
- 5) To appear at Board meetings, to accept Board assignments and to devote the time to communications pertinent to all Board business, including answering correspondence promptly and efficiently.

QUALIFICATIONS FOR NOMINATION

- 1) Nominee must be a Professional Member of AAZK and must have been a member of the Association for at least one year.
- 2) Nominee must be presently employed as an animal keeper/attendant by a recognized zoological institution or aquarium in the U.S. or Canada and must have been in the zoological field for at least two years.

NOMINATION PROCEDURE

- 1) Nominator Form:
 - a. List the name of the nominee, phone, address, and institution.
 - b. State in 150 words or less the reason(s) why the nominee warrants election to the Board.
 - c. Nominator signs forms and mails to NEC Chairman
 - d. Notifies nominee that they nominated him/her for the Board.
- 2) Nominee Biographical Form: (nominee lists the following information)
 - a) Professional background: places of employment, length of service, titles.
 - b) Membership in AAZK: National and local chapters, number of years, offices held, involvement in activities.
 - c) Educational background.
 - d) Membership in Affiliate Organizations: (AAZPA, Audubon, etc.)
 - e) Other information the nominee feels is pertinent.
 - f) References: (one or two)
 - g) Nominee signs forms and mails to NEC Chairman.

NOTE: Candidate is ineligible for nomination if both the nominator and nominee biographical forms are not complete and received by the NEC Chairman by 31 January 1987. Forms are in this issue of the AKF or can be obtained from the NEC Chairman. Send completed forms to: Janet McCoy, NEC Chairman, Washington Park Zoo, 4001 S.W. Canyon RD., Portland, OR 97221.



ELECTION

FORMS

NOMINATOR FORM FOR AAZK BOARD OF DIRECTORS

Qualifications for Nomination:

1. Nominee must be a Professional Member of AAZK and must have been a member of the Association for at least one year.
2. Nominee must be presently employed as an animal keeper/attendant by a recognized zoological institution or aquarium in the U.S. or Canada and must have been in the zoological field for at least two years.

1. Name of Nominee _____

Address: _____

Phone: _____

Institution: _____

2. State in 150 words or less the reason(s) why the nominee warrants election to the AAZK Board of Directors.

3. Signature of Nominator: _____

4. Form must be received by the NEC Chairman by 31 January 1987. Send to:
Janet McCoy, NEC Chairman, Washington Park Zoo, 4001 S.W. Canyon Rd.,
Portland, OR 97221.

NOMINEE BIOGRAPHICAL FORM
AAZK BOARD OF DIRECTORS

1. Name: _____

Address: _____

Phone: _____

PLEASE LIST THE FOLLOWING INFORMATION

2. Professional Background: (places of employment, length of service, titles)

3. Membership in AAZK:

a) National: number of years _____

Activities:

b) Local Chapter(s): number of years, offices held, involvement in activities.

4. Educational Background:

NOMINEE BIOGRAPHICAL FORM/AAZK BOARD OF DIRECTORS, Continued

5. Memberships in Affiliate Organizations: (AAZPA, Audubon, etc.)

6. Other information the nominee feels to be pertinent:

7. References (one or two): give name, address, and phone number where they can be reached.

8. Nominee's Signature: _____

9. Form must be received by NEC Chairman by 31 January 1987. Send form to:

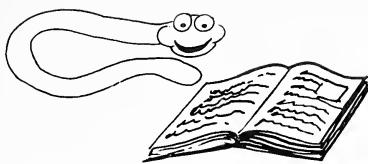
*Janet McCoy, NEC Chairman
Washington Park Zoo
4001 S.W. Canyon Rd.
Portland, OR 97221*

Book Review

How to Become Extinct

By Will Cuppy

University of Chicago Press,
Chicago & London, 1983, 114 ppgs.
\$4.95, paperback



Review by Jay Jasan
Staten Island Zoo
Staten Island, NY

Not since How to Attract the Wombat, also by Will Cuppy, has a book about natural history been so much fun to read. The book consists mainly of personal views and commentaries on a wide variety of fish and reptiles, as well as the work of Aristotle and French naturalist Baron Cuvier. As one reads through Cuppy's essays, one gets the feeling that Cuppy is writing from his personal experiences with the specific animals (even when he discusses the Pterodactyl and Woolly Mammouth!).

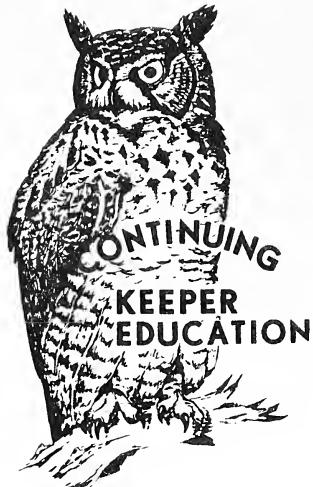
In the section titled "Thoughts in the Aquarium", such topics as "Fish and Democracy" and "Do Fish Think?" are explored. We also learn about the little-known idiosyncrasies of fish from the carp to the silurus. "Reptiles I'm Always Meeting" follows the same pattern. Footnotes are liberally used by Cuppy throughout the book and add humorous asides to the already humorous main text.

Cuppy even treats the topic of the third section (with the same title as the book) with humor, but in a special way. What Cuppy is really poking fun at is not the fact that animals become extinct, but that with all our intelligence, we allow animals to become extinct. This section contrasts the theories behind the extinction of dinosaurs, plesiosaurs, pterodactyls, and the like with the "modern" extinction of the Great Auk and the Passenger Pigeon.

It is important to keep the publication date of the book in the back of your mind while reading How to Become Extinct. In 1941, the extinction of a species was a serious matter, but I somehow feel it was a less desperate matter than it is today. With a growing number of animal and plant species facing extinction every year, it is, at best, difficult to find any humor at all in extinction. Taking all this into consideration, the book is still very entertaining, even to those of us who may come in regular contact with animals that are endangered or even extinct in the wild.

In the Appendix, Cuppy deals with the theory that insects may become the dominant animal life form in "Are the Insects Winning?". The theory of natural selection is discussed in "Thoughts on the Ermine", also in the Appendix. Overall, How to Become Extinct is a wonderful combination of humor and biological information that is not easy to find in a book these days. Although you will not learn a whole lot about the animals discussed in the book, I'm sure anyone who reads it, regardless of their previous zoological knowledge, will be entertained by Cuppy's unique sense of scientific humor.





Checksheet Offers Valuable Tool For Unit Training

Judie Steenberg of the Woodland Park Zoo received much interest in the Checksheet used at her zoo for training staff new to the facility during the 1986 AAZK National Conference in Winnipeg. She has received permission from the Woodland Park Zoological Gardens to have it published in AKF. The checksheet is useful in two ways: (1) the trainer has the sheet to be sure all parts of orientation and/or training are covered; and (2) the trainee has it as a means of insuring that each item is

covered, and from which to ask questions. The best way to use the checksheet is to have both parties review a copy at the start of the training period, and review it periodically until all of the sections have been thoroughly covered and all questions answered. The items can be applied by species, by enclosure (exhibit) and by unit, or area of responsibility.

CHECKSHEET FOR UNIT TRAINING WOODLAND PARK ZOOLOGICAL GARDENS

- ____ Tour of Zoo grounds
- ____ Introduction to employees, hierarchy, policies
- ____ Emergency procedures:
 - ____ location of equipment (capture equipment, fire extinguishers)
 - ____ review procedures for specific unit
 - ____ escaped animals - review Zoo policy
 - ____ earthquake/volcano
 - ____ fire
 - ____ first aid supplies/training
- ____ Animal Health Requirements/Procedures:
 - ____ Temperature requirements (min/max/optimum)
 - ____ species requirements
 - ____ exhibits (methods of maintaining temp/humidity)
 - ____ service areas (effect on exhibits if applicable)
 - ____ Health problems
 - ____ review current problems
 - ____ species susceptibility to disease
 - ____ past problems/remedies
 - ____ Vet cupboard (review supplies)
 - ____ location of forms
 - ____ review use of
 - ____ Prophylactic treatment
 - ____ Review vitamin/mineral requirements/supplementation
- ____ Diets - food storage, preparation, and distribution:
 - ____ Diet cards (review current and seasonal diets)
 - ____ Commissary list and daily food order
 - ____ Diet preparation
 - ____ food containers
 - ____ size/condition of food per species requirements
 - ____ vitamin/mineral supplements per individual requirements
 - ____ Distribution of food (how to feed and where to feed)

CKE COLUMN, WOODLAND PARK CHECKSHEET, Continued

- ____ Equipment location, use and proper storage:
 - ____ Capture equipment
 - use of proper equipment according to species
 - proper storage of equipment
 - additional sources of equipment
 - review past history of unit re: capture and restraint
 - ____ Cleaning equipment and supplies
 - equipment location/use/maintanance
 - chemicals
 - recommended amounts to be used for effective solutions
 - safety requirements
 - safety equipment location
 - ____ Tools permanently locked in the unit
 - location
 - sign-out sheet
 - additional sources of tools used on occasion
- ____ Cleaning exhibits, service areas, sanitizing utensils:
 - ____ Methods, equipment, supplies used
 - ____ Proposed schedule of cleaning
 - ____ Specifics re/service areas
 - ____ Cold soak/sanitizing utensils
- ____ Communication devices/procedures
 - ____ Radio (should be reviewed whether or not one is assigned)
 - ____ proper use (see handout)
 - ____ battery use/storage
 - ____ roster
 - ____ Telephone
 - location (in-house, outside line, scan line, call waiting)
 - directories/instructions
 - Zoo/City telephone lists
 - ____ Records
 - daybook (what to record)
 - daily reports (location of forms/procedures for filling them out)
 - specimen records
 - individual
 - long sheets
 - individual identification methods (banding, ear-tagging, etc.)
 - files (review location of various files in Unit/Zoo)
 - special records - review needs and location of
 - egg charts, temperature/humidity charts, behavioral
 - observations, special procedures (i.e. behavioral
 - research projects)
- ____ Physical plant and operation:
 - ____ Heating system (main plant/fuel supply/auxiliary source)
 - ____ Air circulation and cooling methods
 - ____ Breaker panels/fuse box/main power switch
 - ____ Chargers for hot wires (extra fuses)
 - ____ Water system (main shut off, valves for sprinkling systems)
 - ____ Drains (floor drain location, catch basins, storm sewers)
 - ____ Pest control problems in the unit - location of supplies
 - ____ Lock system - padlock procedure, how to use a chain, lock maintenance

General Information:

Reproduction

history of each animal/species
behavioral norms
incubation/gestation periods
emphasis by species
endangered or not
marketability
holding capacity

Behavioral adaptations by species/individuals

Capture and Restraint - how and for what purpose

MAKE TIME to engage in discussion on the niche of each species in their natural environment. Discuss physical, psychological, locomotive, temperature/humidity requirements of each species in the Unit.

Horticulture: Keepers are responsible for the maintenance of plants within the exhibits. In some areas it is vital that horticulture and/or volunteer support be used to maintain the plant collection.

Specific unit needs

Schedule of water/pruning/fertilizing procedures

Special conditions based on Unit requirements

Pest control

Replacement plants



Keeper's Alert

The Public Education Committee is interested in providing a brochure that discusses common questions about zoos. Past attempts to gather information for this brochure have been less than fruitful, however. It was thought that perhaps a column in AKF might help to accumulate material. A question about zoos or zoo animals will be presented. If you think you have got the perfect answer for that question, tell me about it! In a subsequent issue, an answer to that question will be published. If you think that the answer chosen needs something to make it a perfect answer, let me know! Also let me know if there's a question you'd like to see answered.

Things to keep in mind: (1) Keep it general enough to apply to most zoos; and (2) Keep it simple and concise.

Please, please speak up! I want these questions and answers to be the best that they can be. Don't be too afraid (or too lazy) to give your opinion. Perhaps your chapter could discuss them as the Milwaukee Chapter is doing. Please send all question, answers and comments to:

Ellen Bradfield
Zoo Atlanta AAZK
800 Cherokee Ave., S.E.
Atlanta, GA 30315

The first question I'd like to discuss is:

ARE THE ANIMALS TAME?

Some questions to be included in this discussion are: (1) Do the animals bite? and (2) Can you pet the animals?



SPERM MOTILITY ANALYZER OFFERS BROAD SPECTRUM OF APPLICATIONS

An innovative electronic system for sperm motion analysis was announced at the American Fertility Society's annual meeting in Toronto this past September.

The Hamilton-Thorn Motility Analyzer, or HMT 2000, sets a new standard for fertility testing. Recent research has indicated a relationship between sperm motility (including velocity, linearity, morphology, etc.) and fertility. The analyzer streamlines the viewing, tracking, and interpreting of sperm movement, enhancing the overall process of assessing semen viability.

Previous methods of motion analysis have involved a subjective decision by the human eye, or a laborious process of time-lapse photography. This new device provides an objective analysis in a comprehensive and qualified report.

The HMT 2000 is the newest product from Hamilton-Thorn Research, a biotechnology firm in Danvers, MA, specializing in veterinary products.

"Sperm motility analysis is a natural outgrowth of our work in animal reproduction," comments Meg Douglas-Hamilton, chairman of the company. Hamilton-Thorn developed the widely used Equitainer system of transported semen in 1983.

The HMT 2000 combines optical, video, and analytical systems in a single, dedicated unit. Weighing only 60 lbs., the unit is convenient and simple to use as well as portable. Because all of its systems are integrated, it is highly cost-effective. Among its features are:

1. A unique 200 micron optical chamber which allows unimpeded cell motion. A sample remains in focus throughout the 200 microns.
2. The ability to interface with computers, video recorders, plotters, and TV monitors, maximizing its flexibility.
3. Accuracy at extremes of density and velocity. It is capable of reading up to nine fields for each sample.
4. An internal printer, with the option of color-coded track print-outs.
5. Simplicity and ease of use. The HMT 2000 has only five input keys, and it requires no special training.
6. Complete analysis is only 43 seconds, which frees up technician time.

Besides male fertility testing, other applications for the system include cell motion analysis, in-vitro fertilization, artificial insemination, veterinary school teaching, and assessing the effects of toxins or therapeutic agents.

For further information on the Hamilton-Thorn Motility Analyzer call (617) 777-9050 or write Hamilton-Thorn Research at 30A Cherry Hill Drive, Danvers, MA 01923.



THINK Safety!

ZOO KEEPERS - A SAFETY COUNTDOWN

Ten zoo keepers,
Working on the bear line.
One left a lock off.
Then there were nine.

Nine zoo keepers,
Had a party date;
Thought about it all day.
Then there were eight.

Eight zoo keepers,
Looking up to heaven.
A fat goose flew over.
Then there were seven.

Seven zoo keepers,
Putting out salt licks.
One crossed a camel.
Then there were six.

Six zoo keepers,
Glad to be alive.
One tried out the blow gun.
Then there were five.

Five zoo keepers,
Hosing down the floor.
One sprayed an outlet.
Then there were four.

Four zoo keepers;
One cut his knee.
Never did report it.
Then there were three.

Three zoo keepers,
working as a crew.
One took off alone.
Then there were two.

Two zoo keepers,
Shoveling in the sun.
One was in a hurry.
Now there's only one.

One zoo keeper,
Remembered the other nine.
Began to THINK SAFETY!
And is still doing fine.

---By Jillian Grade
Animal Hospital/Lincoln Park Zoo
Chicago, Illinois

(Editor's note: Our sincere thanks to Jillian for her poetry for this month's THINK Safety! as well as her work the past several years as the column's coordinator. She is resigning from this position and it is being taken on by Marcia Ciborek of the Akron Zoological Park, 500 Edgewood Ave., Akron, OH 44307. Each one of us runs into something on an almost daily basis related to safety--and safety in zookeeping. Why not share what you know, what you read or what you hear through the THINK Safety! column? Newspaper articles on animal-related accidents are good reminders to THINK Safety! And even more valuable than outside articles are recollections of personal experiences involving safety at your zoo. Cartoons are also a good way to get people thinking about safety. Safety in a profession such as zookeeping with all its inherent hazards, needs to be a daily part of every keeper's routine. Plan now to contribute to the THINK Safety! column during the coming year. Send all contributions to Marcia at the address above. If the contribution is from an outside source (newspaper, magazine etc.) please include full source information as some such material requires receiving permission to reprint.)



THE NATURAL AND ZOOLOGICAL HISTORY OF FOUR CAPROMYID RODENTS:

Cuban Hutia (*Capromys pilorides*)
Bahamian Hutia (*Geocapromys i. ingrahami*)
Jamaican Hutia (*Geocapromys b. brownii*)
Haitian Hutia (*Plagiodontia aedium*)

By

Brenda S. Brochstein
Former Animal Technician, Florida State Museum
Graduate of Santa Fe Community College Teaching Zoo

ABSTRACT

The hutias of the West Indies comprise a special and diverse group of rodents whose threatened existence has led to a recent surge in captive propagation programs. The Florida State Museum in Gainesville is attempting to maintain a viable population of members of these groups in a laboratory situation. Eventually, all of the animals will be relocated to The National Zoo of Santa Domingo, Dominican Republic. The Jersey Wildlife Preservation Trust has also been participating in a propagation program and is in the process of re-introducing several captive-born populations into the Island of Jamaica. Several other zoos have jointly participated in breeding programs. With their cooperation, and the information obtained from field research, it is hoped that these endangered rodents can be saved from extinction.

INTRODUCTION

At one time, this remarkable group of rodents from the Caribbean comprised a widely distributed and plentiful group of the family Capromyidae. Of the six recognized genera, only three are now extant and all but one of the surviving species are rare or listed as endangered mammals by the IUCN Red Data Book. Their present status is a typical result of the impact of man on a special environment.

FORMER DISTRIBUTION

Recent fossil taxa demonstrates that the family Capromyidae was once more abundant, widespread and diverse than at present (Oliver, 1977). Living forms contain only ten species, much reduced from its former flourish. There are several causal factors in the decline and destruction of the hutia populations. The most destructive comes from predation by man and the introduction of competitive carnivores. The hutia is considered an edible delicacy and has been hunted by man and dog since the earliest pre-Columbian settlement of the islands. It is probably that hutias were an important food source for early settlers, as the fossils of several extinct species were found associated with human artifacts (Oliver, 1977).

CURRENT STATUS

In general terms, predation by man is less a factor in the current decline of hutia populations than it was in former times. Although all species are legally protected, many, like the Jamaican hutia (*G. brownii*), are still hunted. The Cuban hutia (*C. pilorides*) can even be legally hunted at special times during the year.

Introduction of exotics since the European settlement has had a disastrous effect on the hutia population. Brown rats invaded the islands early, and multiplied raidly due to the absence of predators. The mongoose was

introduced to Jamiaca to counteract the rats. They had an immediate effect, not only on the rats but on other indigenous rodents which quickly disappeared. Mongooses introduced to Haiti have had a direct impact on the living species *Plagiodontia aedium*. Attempts have been made to eradicate the mongoose as in many places they are considered vermin, but these attempts have been unsuccessful.

Cuban hutia (*Capromys pilorides*)

At the Tacoma Zoo in Washington, the largest species of hutia are provided with a spacious enclosure ($3m^2$), and plenty of woody plants are placed inside for food and climbing. Temperature is kept constant at $22-27^{\circ}\text{C}$ (Johnson, Taylor & Winnick, 1975). In the wild, all species apparently retreat into hollow logs or crevices. In captivity, seclusion is necessary for the animal's well being and is probably important for reproduction (*ibid.*)

The Tacoma Zoo studied the four species mentioned in the beginning. Water requirements for all the capromyids studied were low. In general, these requirements are satisfied by succulent foods. It was found that all animals could be kept without water as long as provided with succulents. Anatomical examination verified that all four species are "water conservers". The lengthening of the Loops of Henle in the kidney allow for maximum reabsorption of water (*ibid.*)

Cuban hutias were observed to be largely diurnal. It tolerated group situations well, with some observable pecking order (*ibid.*) Vaginal smears were taken and the estrous cycle was found to average 16.3 days (range 13-19 days). Reproduction occurred at any time of the year with a peak of births in June. The gestation period was determined at 123 \pm 2 days. The nursing period averaged 153 days. The average weight at birth was 199g. Sexual maturity in males reached between 7-10 months; in females at about 10 months.

The young are very precocial at birth; their eyes are open; they are fully furred; they are able to walk about; and the incisors have erupted. As shown by the skull of a newborn young, the pre-molar and the first molar have erupted and the second molar is in the process of erupting (Taylor, 1970).

No nursing was observed until one day of age. Observations of several litters indicated that the young eat small amounts of solid food from two days of age. By the fifth day, the young are eating small amounts of many kinds of succulents and are very sure footed.

Females bear one young the first litter, then two or more. The data obtained supports the conclusion that Cuban hutias are polyestrous. Information on reproductive span and longevity is limited. A minimum reproductive span was for two years, nine months. It is probably much longer than this, judging from the longevity records (9 years, 8 months) but no factual data are available (Taylor, 1968).

The Santa Fe Community College Teaching Zoo in Gainesville, FL received four Cuban hutias from Dr. Charles Woods of the Florida State Museum. He, in turn, received them from the National Zoo in Washington, D.C. The animals came to Santa Fe in July 1980. The zoo housed the two males and two females in a large outdoor enclosure where a pair shared several areas together, and the other male and female were isolated from each other.

THE NATURAL AND ZOOLOGICAL HISTORY OF FOUR CAPROMYID RODENTS, Continued

Temperatures ranges from 105°F in the summer to 15°F in the winter. Each area had one of several dens, some constructed of concrete and others of oak barrels. These dens were furnished with hay yearround with extra added in the winter to provide more warmth for the hutias. They ate a wide variety of fruits and vegetables and were provided with branches to climb on and fresh water to drink, although they were seldom seen drinking (pers. comment).

These particular animals were returned to the Florida State Museum in 1984. The animals never reproduced while at the Santa Fe Zoo, even after exchanging males and females. It is probably that the hutias were too old to breed, as most were 8-9 years of age.

Bahamian hutia (*Geocapromys i. ingrahami*)

The sole remaining population of Bahamian hutias is on East Plana Cay, a very small, semi-arid atoll in the Bahamas. Field studies by Clough (1972) on East Plana Cay reveal that the population is at or near estimated capacity in terms of environmental support - the population being estimated at 6000-12,000 individuals. The hutias are the dominant vertebrate species and have no natural predators; mortality is disease dependent (Oliver, 1977). The high density population is maintained by low reproduction and high social tolerance.

Robert J. Howe (Zoology Dept., University of Rhone Island) maintained a colony of wild-caught Bahamian hutias to study the social behavior of small groups in captivity. Three small groups were established containing 3-4 animals of both males and females. The floor was covered with wood chips and two wooden shelters were provided. Hutias were observed behind a sound-dampening blind which contained a small one-way glass.

A single male was usually compatible with a single female. However, serious strife sometimes resulted between two females caged with a single male. Groups of hutias in the largest room established social hierarchies which usually reduced agonistic behavior. However, the studies indicated that the sexual state of a captive female hutis may contribute to periodic increases in fighting. As a female became more sexually attractive to males, the agonistic behavior increased within the group (Howe, 1971).

The Florida State Museum received a shipment of wild-caught Bahamian hutias in March of 1981. They arrived at the museum's behavior laboratory in two groups of four animals each, consisting of at least one female and one juvenile per group. Each group was maintained in a wooden cage 1m x 2m with sawdust on the cage bottom (Figure 1). PVC pipe was furnished for refuge areas and air kennel tops and bottoms were also used. The animals were observed huddled together for the first couple of weeks. Eventually, individuals would venture out of the tubes and kennels to spend part of the day in the view of the observer (myself). It was decided to provide the hutias with one large cage instead of two smaller ones. This was done and resulted in an increased amount of fighting in which several animals received lacerations on the eyes and other body parts. Several hutias required medical treatment provided by the University of Florida Veterinary College. One juvenile female was found dead. Eventually, the animals re-established themselves and settled down. My last observations of these hutias were in 1982, but as far as is known, the colony continues to reside in the behavior lab and several young have been born.

The gestation period of the Bahamian has not been precisely determined.

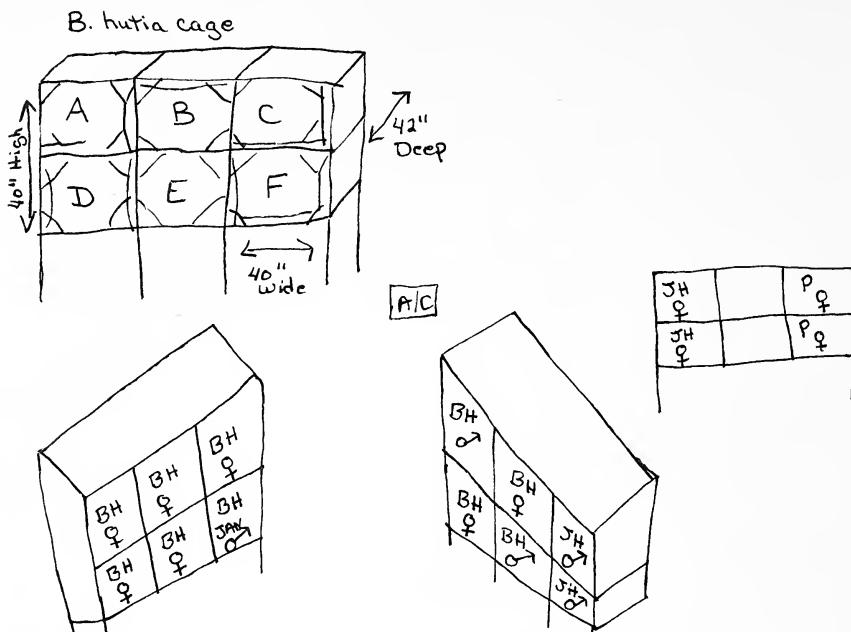


Fig. 1: Drawing of Florida State Museum behaviour laboratory. This arrangement of animals was changed after a year to allow access of males to females and vice versa. Cages were eventually lined with galvanized wire mesh as the hutias chewed through several cage bottoms. PVC pipe was placed in each unit and also placed so the hutias could travel from unit to unit. They were also used as capture nets.

Evidence suggests that there may be considerable individual variation. The six laboratory births at the University of Rhode Island were all single births with different gestation periods. One female gave birth 88 days after a copulation. Three days later, after giving birth, this same female was sexually receptive and copulated twice with the same male. Bucher gives 193-203 days as the hutia gestation period (Howe & Clough, 1971).

Newborns are precocious, related to the long gestation period. When newborn young were observed a few hours after birth, they were walking about with their eyes open. The hutias began eating solid food by at least the third day of life and perhaps earlier. The relative independence of these young at birth is probably related to the absence of nest construction (*ibid.*)

Intense forms of agnostic behavior occurred when groups were being established, when strangers were added to an already established group, and, to a lesser degree, when sexually attractive females were present. After one or two days of considerable agnostic behavior, a social hierarchy with a dominant male is established. Once social hierarchies are set up, they remain unchanged as long as the same animals remain together. A mild threat is usually sufficient to cause a submissive male to turn or move away. During most of the time, the hutias remained compatible and fed together (*ibid.*)

THE NATURAL AND ZOOLOGICAL HISTORY OF FOUR CAPROMYID RODENTS, Continued

Haitian hutia (*Plagiodontia aedium*)

This remaining genus native to the Dominican Republic and Haiti comprises three species, two of which are extinct. The remaining living species, *aedium*, is still hunted by man and specially trained dogs. In addition, their habitat is undergoing progressive clearance and they are preyed upon by introduced mongoose. Little is known of the habits of the Haitian hutia in the wild.

This species is regarded as strictly nocturnal and must be exhibited under a reversed lighting regime. They are not usually fastidious eaters and being essentially vegetarians, they will accept a wide variety of commonly available foods.

The Haitian hutia is more arboreal and utilizes nest boxes placed high off the ground. They do not construct nests and together with a very long gestation period (119 days), relate to the precocial nature of the neonate. The recent importation of Haitian hutias from which are derived all specimens currently in captivity, originally comprised only a very small number of animals sired by a single male (Oliver, 1977). They were found to have an estrous cycle of ten days. A female under the care of the Florida State Museum gave birth as it was isolated, suggesting that it was pregnant at its arrival. The newborn was observed a short time after birth (by myself), had its eyes open and was locomoting very well. It was also seen suckling from its mother's laterally located nipples several times. The day after birth, it was seen suckling and eating some of the solid food provided for its mother.

At Tacoma Zoo in Washington, Haitian hutia was the most particular of the species maintained, although those that survived the best also learned to generalize their diet. Reingestion of the fecal matter (caprophagy) was so marked that fecal residue was almost non-existent, even after several months. This may have been a symptom of nutritional deficiency (Taylor, 1970).

Plagiodontia always acted aggressively, even when quite young. Recently, caught animals could be shipped in pairs or small groups, but prolonged captivity produced an increasing amount of agonistic behavior, requiring a selective reduction in numbers placed together (Johnson, Taylor & Winnick 1974).

Jamaican hutia (*Geocapromys b. brownii*)

Until recently, this hutia species was thought to be restricted to several areas on the island of Jamaica. Destruction of habitat, deforestation, hunting and the introduction of the mongoose have all contributed to the decline of *G. brownii*. Several other endemic species of rodents, birds and reptiles have been exterminated in recent times, a result of which the Jamaican hutia is the island's only surviving terrestrial mammal (Oliver, 1985).

A recent field study conducted for six months in 1982 by William Oliver of the Jersey Wildlife Preservation Trust suggests that the hutia is far more plentiful and widespread than previously thought. The hutia is found today in a wide diversity of habitats from the cool, wet montane forests of the John Crow Mountains to the hot, dry limestone scrub forests of Hellshire (Oliver, 1982) (See Figure 2). The wider distribution may be accounted for by their continuing occurrence in several areas where they had not been previously reported for many years, or where they had not been reported at all as well as a more widespread distribution over regions where they were commonly known to occur.

THE NATURAL AND ZOOLOGICAL HISTORY OF FOUR CAPROMYID RODENTS, *Continued*

Fig. 2 - Present known distribution of extant population of G. brownii.
(William Oliver 1985)



It is important to note that the distribution of the surviving populations is intimately associated with the occurrence of natural fissures and solution cavities in exposed rock formations. The availability of these holes is the single most important factor common to the diverse range of populated habitats (ibid.).

As it was previously thought that the Jamaican hutia was more endangered than recently discovered, a captive propagation program was begun in 1972 at the Jersey Wildlife Preservation Trust. The hutias are maintained in paired social family groups in a series of interconnecting, glass-fronted enclosures (Figure 3). As they are essentially a nocturnal species, they are maintained under a reversed lighting regime for public exhibition purposes. Cages are provided with heaters for the colder months. Several of the housing units are filled with hay which is changed regularly. The Jamaican hutia causes gnawing damage on uncovered or unprotected exposed wood. Certain areas of the nest box are painted with an apparently distasteful household emulsion, tin sheeting or galvanized wire mesh. Re-moveable lids allow for easy inspection and cleaning.

The cages are furnished with tree stumps, logs and networks of branches for climbing and roosting. Sawdust is used on the cage floors. Water is provided continuously and the hutias drink frequently, even though permanent water is usually unavailable to them in Jamaica (Oliver, 1985). They are given a wide variety of fruits, vegetables, seeds and cereal products, as well as fresh cut leafy branches of elm, apple, willow and beech.

No reproductive activity was recorded at the Trust until 1975 following the arrival of additional wild-caught animals. An estimated gestation period of ± 123 days was determined by (Oliver, 1975). These births represented the first successful reproduction of this species outside Jamaica. During the ensuing nine-year period to 31 December 1984, a total of sixty-one litters of ninety-five young were born at the Trust. There appears to be no seasonality of births as they were recorded in all months of the year (Figure 4).

The young are precocial at birth, as most species of hutias. They are fully furred and able to walk soon after birth. They are seen eating solid food 24-48 hours after birth. Suckling is rarely observed, thus the age of weaning is as yet unknown.

THE NATURAL AND ZOOLOGICAL HISTORY OF FOUR CAPROMYID RODENTS, *Continued*

Fig. 3 - Hutia nest box design (William Oliver 1985)

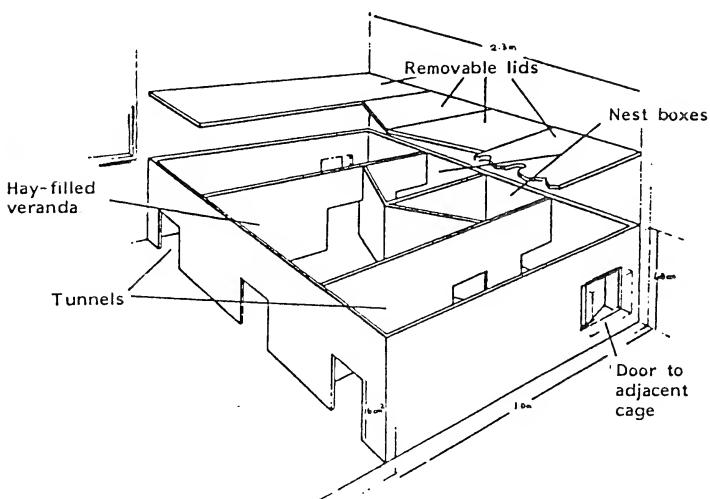
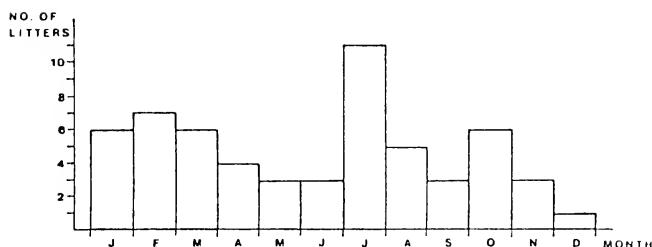


Fig. 4 - Frequency distribution of date of birth of fifty-eight litters of *Geocapromys brownii* born at Jersey Wildlife Preservation Trust during the ten-year period 1975 to 1984 (incl.) (William Oliver 1985)



THE NATURAL AND ZOOLOGICAL HISTORY OF FOUR CAPROMYID RODENTS, *Continued*

A number of these captive-born hutias have been exported to other collections, including the Florida State Museum, who in turn received theirs from the Berlin Zoo. They are maintained at the museum's behavior laboratory in the situation previously described for Bahamian hutias. However, the Trust has had such an increase in population size over the ten-year period since 1975 that it consequently suffered from maintaining too many individuals in its facilities. With the overcrowding comes a much greater risk of a high mortality rate in the event of an outbreak of a contagious disease. As it happens, an outbreak of viral pneumonia occurred in 1979 resulting in the loss of 50% of the Trust's hutia population. Eventually, the population increase was slowed by maintaining individuals in non-breeding situations or large family groups.

As it became clear that the Jamaican hutia was not in immediate danger of extinction in the wild, a need to re-evaluate the relevance of the Trust's breeding program became evident. The program has met its initial criteria of maintaining a captive population and generating new knowledge of the husbandry, biology, ecology and status of the species. The problem became whether the program's continuation could be justified in an already overcrowded environment and with the difficulty to disposing of surplus stock.

The idea to investigate the feasibility of a reintroduction program became possible. A reintroduction program was at first considered inappropriate (Oliver, 1982) as addition of captive-bred stock to an area supporting existing wild populations would not only be unsuccessful, but might even have a negative impact from undue competition for limited resources and the possible risks of disease transmission. However, it was considered feasible to reintroduce Jamaican hutia to an area where this species has been extirpated in recent historical times (Oliver, 1975). There appear to be several suitable areas on the west side of the island, some of which are still forested, and in all other respects comparable to sites where the hutia survives. Evidence indicates the species was eliminated in these areas by past hunting pressure and the lack of available secure holes. It is reasoned that with the cessation of hunting and the addition of artificial holes, the species could survive. The sites were carefully selected to avoid contact with the wild population and lessen the chance of disease outbreak and undue competition.

It is suggested that this proposed project be developed along the lines of a model study of a reintroduction program. This would provide detailed observations of the Jamaican hutia in its natural state and the techniques used for the study could be examined and improved. The only problem is deemed to be the assurance of a totally protected study area as Jamaica has an established network of national parks.

One area was able to fulfill all criteria mentioned (Figure 5). The site is privately owned by amateur naturalists and well protected against human encroachment. Hutias have never been reported there, although the habitat is similar to other wet limestone forest blocks where they still occur. There is no evidence to suppose that Jamaican hutia did not previously exist in this area, especially since two surviving populations have been described fairly near this location. The site is isolated enough to prevent contact by these near-neighbors and had been actively maintained by the land owners in its natural state.

The implementation of the reintroduction program began in May 1984 with the shipment of 22 hutias transferred to the Hope Zoo in Jamaica. There they will remain until January or February 1986 when they will be releas-

THE NATURAL AND ZOOLOGICAL HISTORY OF FOUR CAPROMYID RODENTS, Continued

ed into the study site, and another contingent of the Trust's hutias will be transferred to the Hope Zoo. The Hope Zoo's cooperation will allow the hutias to acclimatize prior to their release and has relieved some of the overcrowding at the Trust. To be included in the study will be a survey of pre-release sites with detailed mapping and vegetational analysis; a selection for the construction of artificial nest sites and construction of temporary holding facilities at the release site. Post-release monitoring by direct observation and radio telemetry will be continued for at least three years - January 1986 to April 1989 (inclusive).

Fig. 5 - Approximate location of the proposed re-introduction site.
(William Oliver 1985)



CONCLUSION

The four extant species mentioned in this paper comprise a remarkable group of rodents endangered from encroachment by man including destruction of habitat, deforestation and hunting. Captive husbandry programs by zoological institutions around the world have been successful in the propagation of these species. Field surveys have demonstrated that one species of hutia, *G. brownii*, was more abundant in the wild than previously thought, suggesting a need for further field research. Reintroduction has become feasible and is to be studied as a model for other reintroduction programs. It is hoped that with this continuing research and interest, the hutia will not become one of the many to be exterminated by man.

ACKNOWLEDGEMENTS

My special thanks to Richard Rosen, Dr. Charles Woods and Margaret Langworthy who all got me interested in these wonderful creatures.

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POULTRY CLASS TEACHES VALUABLE LESSON

Submitted by Kerry Hoffman, Arizona-Sonora Desert Museum

I took a Poultry Production class at the University of Arizona last year and it turned out to be the most valuable class I have ever taken. We discussed housing, nutrition, disease recognition, treatment and prevention, forced molting, artificial insemination and artificial incubation/chick rearing. I strongly recommend a poultry class to all serious aviculturists. One day in class the instructor spoke a truism which I would like to share as it applies to all captive animal situations. He was lecturing on housing and proper care of your birds and he said, "The quality of care your animals receive is directly related to the comfort of your keepers while providing that care. Make the keepers' job as easy as possible so they can devote their entire attention to providing quality care to your animals, not jury-rigging tools or simply 'making do' with what's available."



AAZK Regional Coordinators

Co-Directors Regional Coordinator System

States East of Mississippi - Diane Krug, Rt. 1, Box 273, Hilliard, FL 32046. (904) 225-9559 (work)
(904) 845-4279 (home)

States West of Mississippi - Debbra Stecher, Woodland Park Zoo, 5500 Phinney Ave. North, Seattle, WA 98103
(206) 625-5402 (work) (206) 745-8198 (home)

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John Linehan, Franklin Park Zoo, Boston, MA (617) 442-7646 (w)
for the states of ME, VT, NH, MA, RI, CT

Peter Buchholz, Bronx Zoo, New York (212) 220-5154 (w) (718) 229-7711 (h)
for the state of NY

Gene Pfeffer, Philadelphia Zoo, PA (215) 243-1100 (w)
for the states of PA, NJ, MD, DE

VACANCY - for the states of W. VA, VA, D.C.

VACANCY - for the state of Michigan

Lynne Villers, Indianapolis Zoo, IN (317) 547-3577 (w)
for the states of IN, OH, KY

Larry Sammarco, Lincoln Park Zoo, Chicago, IL (312) 294-4660 (w)
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Pat Hook, Riverbanks Zoo, Columbia, SC (803) 779-8717 (w)
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Tim Kurkowski, Zoo Atlanta, Atlanta, GA (404) 624-5600 (w) (404) 428-0535 (h)
for the states of GA, AR, AL

Marcelle Guidry, Greater Baton Rouge Zoo, LA (504) 775-3877 (w) (504) 388-9392 (h)
for the states of LA, MS

Vikki Bohnert, 2264 Winkler Ave., B-11, Ft. Myers, FL 33901
for the state of Florida

John R. Turner, Denver Zoo, Denver, CO
for the states of CO, NM, TX

Steve Tigges, Tulsa Zoological Park, Tulsa, OK
for the states of OK, NE, KS, ND, SD

Laurence Gledhill, Woodland Park Zoo, Seattle, WA (206) 625-5497 (w)
for the states of WA, OR, ID, MT, WY, AK

Art Goodrich, San Diego Zoo, San Diego, CA
for the states of CA, NV, UT, AZ

Honolulu AAZK Chapter (Dan Vitiello, Pres.) (808) 923-4772 (w)
for the Hawaiian Islands

Neville Howard Pike, Metro Toronto Zoo, Box 280, West Hill, Ontario M1E 4R5
for the Province of Ontario, Canada

Bob Debets, Assiniboine Park Zoo, 2235 Corydon Ave., Winnipeg, Manitoba
R3P 0R5 (204) 489-3893 (home)

for the Province of Manitoba, Canada

Marcia Rasmussen, Calgary Zoo, P.O. Box 3036, Stn. B., Calgary, Alberta
(403) 235-5461 (home)

for the Province of Alberta, Canada

Need membership information? Want to learn more about AAZK or start a chapter or become more active - then call your RC! There are still openings for RC positions for the state of Michigan and for the combined region of West Virginia, Virginia and Washington, DC. If you are interested, please contact Diane Krug, Eastern U.S. Regional Co-Director. You may call Diane collect at her home phone (904) 845-4279 evenings after 6 p.m. EST. These two positions offer a great opportunity to become involved in AAZK and to provide a valuable and necessary service for the Association.

Institutions wishing to advertise employment opportunities are asked to send pertinent data by the 15th of each month to: Opportunity Knocks/AKF, 635 Gage Blvd., Topeka, KS 66606. Please include closing dates for positions available. There is no charge for this service and phone-in listings of positions which become available close to deadline are accepted.

ELEPHANT HANDLER/KEEPER...immediate opening. Will assist trainer with African elephant husbandry and public demonstrations. Great opportunity for qualified person. Contact Val DeLeon, 9777 Golf Links Rd., Oakland, CA 94605 (415) 632-9525. Salary \$8.00 per hour plus benefits.

AMAZON WILDLIFE REHABILITATION INTERNSHIP...one to four week internships available to rehabilitate wildlife confiscated from the illegal pet traffic and reintroduce in climax rainforest. Live and work at wildlife field station, located in remote jungle. Interns must pay airfare, room, board and tuition. Contact: Quabaug Foundation, 315 Palmer Rd., Ware, MA 01082.

EDUCATION TECHNICIAN...requires bachelor's degree in biology or a related field and preferably experience in zoo education program development and instruction. Position will be responsible for the care and management of a large and varied collection of small animals and animal biofacts used specifically for educational program purposes. In addition, responsibilities will include assisting with education program implementation and instruction. Salary \$13,000 plus full benefit package. All resumes to be sent to Craig Sholley, Curator of Education, Baltimore Zoo, Druid Hill Park, Baltimore, MD 21217.

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WILD AMERICA BEGINS FIFTH SEASON ON PBS

The series is planned to air on PBS stations around the country on Thursday evenings at 8:00 PM Eastern Time. Check your local listings as days and times may vary in your area. Dates and titles for this season's offerings of "Wild America" are listed below:

<u>Pennsylvania Whitetail</u> (deer)	January 8, 1987
<u>Woodies and Hoodies</u> (ducks)	January 15, 1987
<u>King of Snakes</u> (rattler)	January 22, 1987
<u>Family Feud</u> (aggressive behaviors)	January 29, 1987
<u>River of Bears</u> (brown bears)	February 5, 1987
<u>Wild Texas</u> (endemic wildlife)	February 12, 1987
<u>A Prairie Park?</u> (prairie ecosystems)	February 19, 1987
<u>The Grouse and the Goshawk</u> (predator/prey relationship)	February 26, 1987
<u>Otters of the Adirondacks</u> (river otter)	March 5, 1987
<u>Growing Up Wild</u>	March 12, 1987



AAZK MEMBERSHIP APPLICATION

Name _____ Check here if renewal []

Address _____

____ \$25.00 Professional Full-time keepers	____ \$20.00 Affiliate Other staff and volunteers
____ \$25.00 International All members outside the U.S. and Canada	____ \$15.00 Associate Individuals not connected with an animal care facility
____ \$15.00 Library Library subscription only	____ \$50.00 Contributing Organizations and Individuals

Directory Information: Zoo _____

Work Area _____ Special Interests _____

Mail this application and check or money order (U.S. CURRENCY ONLY PLEASE), payable to American Association of Zoo Keepers, Inc., to: AAZK National Headquarters, Topeka Zoo, 635 Gage Blvd., Topeka, KS 66606.

Membership includes a subscription to *Animal Keepers' Forum*. The membership card is good for free admission to many zoos and aquariums in the U.S. and Canada.

INFORMATION FOR CONTRIBUTORS

Animal Keepers' Forum publishes original papers and news items of interest to the Animal Keeping profession. Non-members are welcome to submit articles for consideration.

Articles should be typed or hand-printed. All illustrations, graphs and tables should be clearly marked, in final form, and should fit in a page size no more than 6" x 10" (15cm x 25½cm). Literature used should be cited in the text and in final bibliography. Avoid footnotes. Include scientific names. Black and white photos only accepted.

Articles sent to *Animal Keepers' Forum* will be reviewed for publication. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Those longer than three pages may be separated into monthly installments at the discretion of the editorial staff. The editors reserve the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope.

Telephone contributions on late-breaking news or last-minute insertions are accepted. However, phone-in contributions of long articles will not be accepted. The phone number is (913) 272-5821)

DEADLINE FOR EACH EDITION IS THE 15TH OF THE PRECEDING MONTH

*Articles printed do not necessarily reflect the
opinions of the *Animal Keepers' Forum* editorial
staff or the American Association of Zoo Keepers.*

Items in this publication may be reprinted providing credit to this publication is given. Reprints may be ordered from the editor.

American Association

of Zoo Keepers

Topeka Zoological Park

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FEBRUARY 1987

Animal Keepers' Forum



Dedicated to Professional Animal Care

ANIMAL KEEPERS' FORUM, 635 Gage Blvd., Topeka, KS 66606.



Executive Editor: Alice Miser
Managing Editor: Susan Chan
Associate Editor: Ron Ringer

FEBRUARY 1987
VOLUME FOURTEEN
NUMBER TWO

Animal Keepers' Forum (ISSN 0164-9531) is a monthly journal of the American Association of Zoo Keepers, Inc., 635 Gage Blvd., Topeka, KS 66606. Five dollars of each membership fee goes toward the annual publication costs of *Animal Keepers' Forum*. Second Class postage paid at Topeka, KS. Postmaster: Please send address changes to:

AMERICAN ASSOCIATION OF ZOO KEEPERS, INC.
NATIONAL HEADQUARTERS, 635 GAGE BLVD., TOPEKA, KS 66606
Barbara Manspeaker, Administrative Secretary

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States East of the Mississippi - Diane Krug, White Oak Plantation, Yulee, FL
States West of the Mississippi - Debbera Stecher, Woodland Park Zoo, Seattle, WA
Individual Regional Coordinators and the states under their oversight are listed elsewhere in each issue of *Animal Keepers' Forum*.

Featured on this month's cover is the North American Badger (*Taxidea taxus*) drawn by Tom La Barge, a carnivore keeper at the new Burnet Park Zoo in Syracuse, NY. A member of the family known as mustelids, the badger finds most of its food underground. One of the world's fastest digging mammals, it hunts by breaking into the burrows of gophers, rats and squirrels. The badger's wide flat body can be used to block the entrance of its den and the loose folds of skin on the sides of its body make it difficult for predators to get a good hold on a badger. Thanks, Tom!

Scoops and Scuttlebutt

CHANGE IN RC POSITIONS ANNOUNCED

Gene Pfeffer, Philadelphia Zoo, has resigned as RC for the states of PA, DEL, NJ, AND MD. Denise Robinson, also of Philadelphia, will be assuming this area of responsibility. Peter Buchholz, Bronx Zoo, has taken two new areas under his RC responsibilities. Peter will now be RC for NY, VA and the District of Columbia. RC Co-Director Diane Krug has also announced the resignations of Pat Hook, Riverbanks Zoo, and Lynn Villers, Indianapolis Zoo, from their respective RC positions. AAZK thanks Gene, Pat and Lynn for their work in the past and welcomes Denise to her new position. There are still two RC areas which need RC's to be assigned. See the Regional Coordinators listing in this month's AKF (see gold insert).

FOREIGN KEEPER SPONSORSHIP PROGRAM CONTINUES TO GROW

Joining the Tucson and Atlanta Chapters in the sponsorship of a keeper from a foreign country are several AAZK Chapters and/or individuals. The Rocky Mountain Chapter in Denver has "adopted" two keepers, one in India and one in Honduras. The Flint Hills Chapter, Manhattan, KS, has agreed to sponsor a keeper from Orissa, India. AAZK member Art Cooper, Front Royal, is sponsoring a game warden in Ghana, West Africa. The Kansas City AAZK Chapter is sponsoring an individual in Brazil and the San Diego Zoo AAZK Chapter recently "adopted" the Deputy Director of the Zoological Society of Thailand. It is hoped this sponsorship program will enhance our knowledge about zookeeping worldwide and provide AAZK with the opportunity to assist sponsored individuals in the acquisition of educational and husbandry materials. If you or your Chapter is interested in sponsoring a foreign keeper, contact either of the International Affairs Coordinators listed on the front inside cover of AKF.

CO-FOUNDER OF INTERNATIONAL CRANE FOUNDATION DEAD AT 38

Ronald T. Sausey, co-founder of the International Crane Foundation in Baraboo, WI died on 7 January of a cerebral hemorrhage. Sausey and George Archibald established the foundation in late 1970 on land owned by Sausey's parents. The goal of the foundation was to build a breeding population of the endangered crane species that could be used to restock the wild flocks or at least assure that the depleted species would not die out entirely. The foundation became world famous for its success in breeding these endangered species and specialists from all over came to the foundation to study and conduct research. The International Crane Foundation was particularly known for its work in Japan, China and India where they worked with local ornithologists and government officials on protection and recovery plans for those nation's endangered crane species.



Coming Events

6TH ANNUAL NATIONAL WILDLIFE REHABILITATORS ASSOC. SYMPOSIUM

March 18-22, 1987

Clearwater Beach, FL

For more information contact: Symposium Information, Suncoast Seabird Sanctuary, 18328 Gulf, Blvd., Indian Shores, FL 33535 (813) 391-6211, Attn: Barb Suto.

AAZPA NORTHEASTERN REGIONAL CONFERENCE

March 15-17, 1987

Syracuse, NY

For more information contact: James Aiello, Curator Education/Docent Chairman, Burnet Park Zoo, Syracuse, NY 13204 (315) 425-3775.

AAZPA WESTERN REGIONAL CONFERENCE

April 5-7, 1987

Fresno, CA

For more information contact: Scott Ransom, Asst. Zoo Manager, Fresno Zoo, 894 Belmont Ave., Fresno, CA 93728 (209) 488-1549.

AAZPA CENTRAL REGIONAL CONFERENCE

April 12-14, 1987

Colorado Springs, CO

For more information contact: Gerald Brady, General Curator, Cheyenne Mountain Zoo, Box 158, Colorado Springs, CO 80901 (303) 633-0917.

AAZPA GREAT LAKES REGIONAL CONFERENCE

April 26-28, 1987

St. Louis, MO

For more information contact: William Boever, DVM, St. Louis Zoological Park, Forest Park, St. Louis, MO 63110 (314) 781-0900.

AAZPA SOUTHERN REGIONAL CONFERENCE

May 3-5, 1987

Tampa, FL

For more information contact: Judith Breuggeman, Education Coordinator, Busch Gardens, Box 9158, Tampa, FL (813) 988-5171.

AAZK 20TH ANNIVERSARY "FOUNDERS WEEKEND"

May 5,6,7, 1987

San Diego, CA

Held to honor the original founders of AAZK, the "weekend" will include workshops, tours, banquet etc. For an information/registration packet contact AAZK Historian Art Goodrich, Mammal Dept., San Diego Zoo, Box 551, San Diego, CA 92112.

BOTANICAL AND WILDLIFE ART SHOW

May 14-17, 1987

Los Angeles, CA

For more information contact: Patti Glover, Los Angeles Zoo, 5333 Zoo Dr., Los Angeles, CA 90027 (213) 664-1100.

COMING EVENTS, Continued

FIRST INTERNATIONAL CHILDREN'S ZOO SYMPOSIUM

1-4 July 1987

Philadelphia, PA

As we all know, keepers are essential for the successful learning experience of the casual visitor to a Children's Zoo. Keeper participation is also essential for a successful Children's Zoo Symposium. We would like keepers to present papers and participate in workshops during this symposium. The symposium will focus on History and Philosophy, Design and Learning, and Animal Collection and Purpose. There will be pre- and post-conference trips to the Bronx and Baltimore Zoos plus much more. registration is \$100.00. For further information, contact: Robert Callahan, Curator of Children's Zoo, Philadelphia Zoo, 34th St. & Girard Ave., Philadelphia, PA 19104 (215) 243-1100, Ext. 300.

APPLYING BEHAVIORAL RESEARCH
TO ZOO ANIMAL MANAGEMENT

July 18-25, 1987

Seattle, WA

Hosted by the Woodland Park Zoological Gardens. For more information contact: William Karesh, DVM, Animal Health Dept., Woodland Park Zoo, 5500 Phinney Ave. N., Seattle, WA 90103. Enrollment limited to 40 participants. Registration fee is \$80 if paid by 1 May and \$100 thereafter.

THE SOCIETY FOR THE STUDY OF AMPHIBIANS & REPTILES/
HERPETOLOGISTS LEAGUE ANNUAL MEETING

August 9-15, 1987

Veracruz, Mexico

Hosted by the Institute of Biology of the National Autonomous University of Mexico. For further information contact: Richard Vogt, Estacion de Biologia Tropical "Los Tuxtlos", Universidad Nacional Autonoma de Mexico, Apart. Post 94, San Andres Tuxtla, Veracruz, Mexico.

13TH NATIONAL AAZK CONFERENCE

October 4-8, 1987

Milwaukee, WI

Hosted by the Milwaukee County Zoo AAZK Chapter. Watch your Forum for registration details. For more information contact: Steve Wing, Milwaukee County Zoo, 10001 Bluemound Rd., Milwaukee, WI 53226.



AAZK AWARD NOMINATIONS ARE NOW BEING ACCEPTED FOR 1987!

The AAZK Awards Committee would like to begin to accept nominations for the awards to be presented at the 1987 AAZK Conference in Milwaukee. In the following months there will be information concerning the qualifications, nomination procedure, selection procedure, and an explanation of the AAZK EXCELLENCE IN ZOOKEEPING (EZ), CERTIFICATE OF MERIT FOR ZOOKEEPER EDUCATION (CMZE), and the MERITORIOUS ACHIEVEMENT (MA) awards.

The deadline for all award nominations is 1 JUNE 1987, so please keep this in mind when submitting your nominations. All awards given by AAZK have no minimum or maximum number offered each year, but if the nominees do not meet the qualifications and nominations procedure, they will not receive the award for which they were nominated. Please submit all nominations to:

Rachel Rogers, Chairperson
AAZK Awards Committee
METROZOO
12400 SW 152 Street
Miami, FL 33177

AAZK CERTIFICATE OF MERIT FOR ZOOKEEPER EDUCATION AWARD

This award is given to the zoo or aquarium most actively promoting educational programs for zookeepers. This may include: keeper training courses, staff seminars, and reimbursement for formal education would be considered programs that are descriptive of this award.

Qualifications:

1. Any North American zoological institution or aquarium is eligible.
2. The keeper training program must have been in existence for at least one year.

Nomination Procedure:

If you feel that your zoo or aquarium merits such an award, please submit a letter of nomination which mentions specifically the educational programs that are offered.

Selection Procedure:

The Awards Committee, consisting of five keepers, will independently review each nominee.

AWARD DEADLINE 1 JUNE 1987

Next month: AAZK Meritorious Achievement Award



CAUZ SEEKS TO LINK AQUARIUMS, UNIVERSITIES & ZOOS
IN BENEFICIAL PARTNERSHIP

ATTENTION MEMBERS: Recently, AAZK has become an active participant in the newly established network CAUZ, the Consortium of Aquariums, Universities and Zoos. CAUZ was formed in response to the real need for a formal educational and research link between the university and the aquarium/zoo worlds. Dr. Donna Hardy of California State University, Northridge, introduced the program at a formal meeting held at the Faculty Center, CSUN, on 21 August, 1985. Sixty noteworthy professors and professionals from many aquariums, universities, museums and zoos in the United States met to share ideas and explore the functions of the Consortium. The following were the ideas presented. Further information on CAUZ will be presented in upcoming issues of AKF.

---Jean Hromadka, AAZK President

CAUZ - Part 1

- There is a need for both increased involvement of universities in research at zoos as well as an increased cooperation between zoos and research projects.
- There is a need for faculty to understand how zoo research is conducted.
- Because of increasing problems in housing animals in university laboratories, researchers should make more use of opportunities to conduct research at the zoo.
- The Nature Conservancy is anxious to have field research conducted at its preserves.
- Educational programs in zoos have grown greatly in the past 15 years, but most of these programs have been aimed at the elementary level. It is time for the development of new educational programs for older students as well as adults.
- Clearing Houses established by some zoos (primarily for distribution of animal parts) can be more widely used for educational and research projects in universities and museums.
- The university can help zoos train volunteers in zoo education and zoos can aid the university in its role in training science educators.
- The zoo and the university can co-sponsor education symposiums as well as continuing education courses.
- University professors need to increase conservation awareness in their students as well as introduce them to the great importance of zoos in their role of preservation of rare and endangered species.
- Aquariums/Zoos can use university personnel to conduct needed research programs with minimal expense to the zoo.
- The consortium makes available a data bank of information, including funding sources, literature searches, etc.

Speaker topics included: "The Relationship Between Zoos and Universities From the Zoo Director's Perspective," by Dr. Terry Maple, Zoo Atlanta; "The Need for Standardized Research Protocols in Zoos," by Dr. Joe Erwin; funding methods, media center (slide, television, and graphics) facilities, library computerized searches of titles, courses presently taught on zoos, and other organizations of interest to the Consortium such as AAZPA and AAZK.

CAUZ - PART 1, Continued

The Consortium feels that animal keepers are an important part of zoo research, supplying not only essential animal knowledge and daily time schedules, but also as a source of ideas for research needed to be done at the zoo. The Consortium is eager for AAZK members to participate in discussions and contribute their ideas about ways in which the Consortium can better integrate all parts of zoo research.

The following points were made in the general discussion of the need for this consortium and its functions:

1. A network is needed to link educators and researchers at zoos, aquariums and universities.
2. Successful consortia in the C.S.U.C. system have a lot of capital involved; this Consortium needs a facility to establish its permanence.
3. Joint financial commitment of the zoos and universities is needed.
4. This Consortium network can help the university recognize how valuable a resource they have in the modern zoo and aquarium.
5. Zoos and aquariums can help the university in its maintenance of live animals.
6. The Consortium can help faculty who wish to do research at the zoo by providing training in observational techniques.
7. Since much of the valuable work done at zoos and aquariums does not reach print, collaboration with university people can increase the possibility of its publication.
8. Since zoos and aquariums are obliged to work with university students as part of its educational commitment, the Consortium can help their professors provide better supervision and guidance with their projects.
9. The university can develop and coordinate extension courses involving zoos and aquariums for teacher education students as well as science teachers.
10. The special high ability high school students could be involved with the zoos and aquariums in the grant-funded summer programs.

The following points were made in the general discussion of the formation and structure of the organization:

1. Options in forming the organization include having the S. California Academy of Sciences or the Animal Behavior Society take it over.
2. The organization could begin informally as a conference, then later create a purpose; the organization could be formed as an institute, which has a singular purpose; since a consortium is more loosely arranged than most other organizations, this form is the most appropriate for our purposes.
3. Voluntary participation in our organization is important.
4. The main function of our Consortium is creating a wide network for sharing of information - using electronic bulletin boards and a newsletter. The Consortium headquarters at the hosting institute can act as the information clearing house.
5. The Consortium can provide a procedural format for interns at zoos and aquariums, provide guidelines for professors as well as students for doing research at zoos and aquariums, coordinate long-term series of individual students to work on single projects, provide skills-seminars to students and professors, etc.
6. Zoos can provide lists of projects of importance to them, including studies of visitor behavior and exhibit evaluation.
7. Consortium can provide a "skills bank" as well as pool resources.
8. A standardized data base can be provided by the Consortium for pooling animal resources [The ISIS database of AAZPA already exists].

CAUZ - Part 1, Continued

9. The Consortium can link the university, zoo and aquarium researchers and educators with natural history museums, which have a long history of welcoming university researchers.
10. Zoo and aquarium educators can work with university educators in developing better teacher workshops as well as improving zoo education programs.

ANIMAL KEEPRS' ROLES IN THE CONSORTIUM

- 1.] To give input on feasibility of research proposals.
- 2.] Provide animal data: histories, diets, time schedules, animal identifications, social relationships, behavioral traits/problems.
- 3.] Assist researcher by manipulation of: animals, cages, diets, time schedules.
- 4.] Assist researcher with data collection.
- 5.] Promote the consortium through AKF with articles by keepers on research projects.
- 6.] Suggest possible research topics.
- 7.] Tell researchers what aspects of their animals need to be studied (problems that need solving) and what is currently being studied.
- 8.] Give talks to classes on what the occupation of Animal Keeper involves and how keepers manipulate their animals.

BENEFITS FOR ANIMAL KEEPRS FROM THE CONSORTIUM

- 1.] Acknowledgement on research papers.
- 2.] Copy of research paper - results of study
- 3.] Possibility of certificate program -- "Certificate of Participation"
- 4.] Bibliography of literature on the animals or problems being researched.
- 5.] Observational/research skills and techniques
- 6.] Representation and recognition by the consortium
- 7.] Access to channels for funding: keeper research projects, trips abroad to study animals, presenting papers at conferences.
- 8.] Access to university library facilities and topic scanning procedures.
- 9.] Access to university film libraries (for AAZK lectures, etc.)
- 10.] The use of university personnel and equipment to help solve existing problems with their animals.
- 11.] Possible continuing education credits for participation in research or from courses offered by the consortium.

From this first meeting that was held, a organizing committee was elected and the consortium officially recognized Dr. Donna Hardy as President. The consortium will be providing a quarterly newsletter to anyone interested. For more information contact: Dr. Donna Hardy, Professor of Psychology, California State University, Northridge, Northridge, CA 91330 (818) 771-5055.

(Editor's note: More information on CAUZ will appear in the March issue of AKF. Part 2 will cover some of the ideas which came from the meetings of both the Education and Research Groups.)



SAYING GOODBYE
Laurence H. Brainard
(1918 - 1986)



*Larry Brainard and a friend in a quiet moment at the San Francisco Zoo.
Photo Credit: Judy Howard*

It is always difficult saying goodbye to a friend. Larry was involved with the San Francisco Zoo for over 15 years, he was the "original volunteer". I have never met anyone with greater love and dedication to the San Francisco Zoo.

Larry's countless projects and accomplishments at the zoo bespeak his dedication. He helped organize the first Zoo Run in the country in 1976. He served for four years on the Docent Executive Committee and was instrumental in founding our local chapter of the AAZK and was on the Board of Directors. He was the editor of the reference volume "Biological Values for Selected Mammals" and a recipient of the coveted "Good Egg" award. The list goes on and on.

Larry's greatest contributions were not the ones with titles but rather the countless day to day little ways he found to help. He was always there in the Nursery, out giving one of his popular tours, in the classroom stapling and stuffing, on the phone helping with fundraising, or out for a stroll looking for someone who could use help. Whenever something needed to be done, Larry was there.

Larry's happiest times were probably in the nursery. He helped raise the baby orangutans, Thelma and Oliver. The zoo was truely Larry's family. Larry simply didn't know how to give a little, he only knew how to give a lot. We will all miss him.

SAYING GOODBYE, Continued

Contributions to the San Francisco Zoological Society may be made to the Laurence H. Brainard Memorial Fund.

Norman Gershenson, President
Greater San Francisco Bay Area AAZK

Dear AAZK Members:

Shortly before Christmas, I received the very sad news of Mr. Larry Brainard's passing. Larry had been an active AAZK member who was at the time of his death, working in the Education Department of the San Francisco Zoo. Although Larry was retired and older than the average active AAZK member, he never showed signs of slowing down when it came to the Association. Most of you know of him through the countless hours he devoted to help produce our very popular publication Biological Values for Selected Mammals, editions I and II. Recently he had spent most of his energy organizing the Greater San Francisco Bay Area Chapter which totals an impressive membership of over 100 individuals. Not only was he busy organizing the formation of chapter committees, but also served on a few of them as well. He had also offered some valuable suggestions for a few of National's popular projects such as the Keeper Accommodation List (KAL) and the formation of a chapter constitution, currently under review by the Board of Directors. Through his example, we can all discover many positive ways of contributing to the Association. Larry understood the importance of offering ideas and suggestions that would only help and strengthen AAZK. He was aware of the pleas National continues to vocalize to her members and that growth and improvements can only be accomplished through the concern and support of all those involved.

On behalf of the AAZK Board of Directors and her members, I would like to offer our most sincere condolences to Larry's family, friends and co-workers. I know he will be sorely missed. Presently, we are discussing ways we would like to consider to show our appreciation and respect for Larry. One idea is to have a brief memorial in honor of Larry printed on the inside front cover of the next edition of the Biological Values publication. There has been a memorial fund established by the San Francisco Zoo so if anyone would like to make a personal contribution, please contact the zoo for more information.

Jean Hromadka
AAZK President



Keeper's Alert

The AAZK-Milwaukee Chapter would like to thank all those who purchased the AAZK logo coffee mugs. The sales have been better than expected. The mugs became available nationally only last June, and we sold out 141st mug in November. Because of the overwhelming response we have had to re-order a second 12 dozen from the factory. Therefore, logo mugs are still available. See either the September or December 1986 issues of AKF for details on ordering.



CONFERENCE '87 - First Call For Papers

Papers will be accepted on a wide range of topics concerning zookeeping and animal husbandry, such as breeding, hand-rearing, diets or exhibits. Examples of papers can be found in the December 1986 issue of AKF.

Papers will be published in the Forum, so use the "Guidelines for Typing Papers for AAZK Conference Proceedings". The guidelines will be published in a subsequent issue of AKF.

Papers will be limited to 20 minutes followed by a 5 minute discussion period. An outline or abstract must be submitted by 15 July, 1987 along with the following information

Name of Presenter _____

Zoo Affiliation _____

Position/Title _____

Title of Paper _____

Equipment Needed _____

Send to: Papers Committee, AAZK Conference '87, Milwaukee County Zoo, 10001 W. Bluemound Road, Milwaukee, WI 53226.

MILWAUKEE - A Lot More Than The Three B's

Beer, bratwurst and bowling. This is what you think of when you hear Milwaukee. While the three B's are ingrained into our heritage, most people do not know of the charms our city of 1.4 million has to offer.

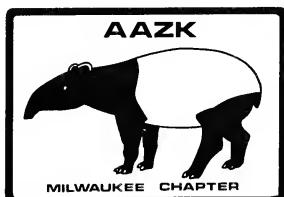
Milwaukee is situated directly on Lake Michigan and has miles of beautiful beaches. The park system is one of the largest in the country. Summertime brings us a different ethnic festival every weekend - IrishFest, Festa Italiana, AfroFest and GermanFest to name a few. Dubbed as one of the cleanest and most crime-free cities of its size, Milwaukee has a home-town feeling.

The Milwaukee County Zoo is a beautifully wooded, 185-acre park with an emphasis on the predator-prey style of exhibition. Prey species such as antelope and zebra roam in large moated exhibits while the predators (lions, cheetahs, etc.) are viewed directly behind them. Over 4000 animals from 600 species inhabit our facility. Rare and endangered species include bonobo, Indian rhino, Humboldt penguin and bongo antelope.

The aviary includes two large walk-through flight exhibits. Four species of penguin are also exhibited here. The Primate Building features two breeding families of siamangs, gorillas, dianas and mandrills. The Reptile/Aquarium facility contains many species of reptiles, fish and invertebrates including 60+ lb. pacu and a 50,000-gallon freshwater tank called Lake Wisconsin. The Small Mammal Building exhibits 40 species, including five types of bats, many in mixed species exhibits. Our North American Trek displays moose, four species of bear and the agile Dall sheep. A management program of our three Asian and two African elephants was begun in 1980 and has progressed far in seven years. The hoofstock area contains bactrian camel, antelope and storks, cranes and vultures from Africa, Asia and South America. Directly in the center is our Feline Building which exhibits 10 species of cats and hyenas. Our Australian Building exhibits marsupials and birds such as red kangaroo, emu and kookaburra.

The Children's Zoo is the new home to our dairy barn, and antique octagonal barn featuring dairy cows and interpretative graphics. The dolphin facility, new in 1986, will provide an informative show with two dolphins and a California sea lion.

We have planned the dates for the conference, 4-8 October, with the changing colors of the leaves in mind. The reds, oranges and yellows should be at their peak during your visit. Daily temperatures should be 60-70°F, but the nights could be chilly. See you all in October.



CONFERENCE HEADQUARTERS

The Sheraton Mayfair Inn



The Sheraton Mayfair Inn is ideally located just off Highway 45, across from the Mayfair Shopping Mall, and minutes from the Milwaukee County Zoo. We offer 150 luxurious guest rooms and suites, each with color TV, alarm clock, and all rooms have 24-hours of movies, news and sports.

For fine dining, entertainment and dancing, may we suggest Bannisters Restaurant and Brandy's Lounge, located right in the Inn. All hotel guests are encouraged to relax in our heated indoor pool and sauna. Free covered parking is available for up to 400 cars.

Based on your sleeping requirements, the Sheraton Mayfair Inn can offer a special rate of \$50.00 single or double occupancy.

The Sheraton Mayfair Inn will assure you of an experienced staff, trained to fill the needs of your conference. Registration forms will follow in the March issue of Animal Keepers' Forum.

A PUZZLE THAT CAN PAY OFF

The Milwaukee County Zoo will be sponsoring a raffle during the Conference. Two nights free lodging will be donated by the Sheraton Mayfair Inn. Tickets will be sold at registration, during the Conference. By filling out the crossword puzzle on the opposite page, you can gain two free chances.

Three or four clues will be presented each month in upcoming issues of the Forum. Answers can be found somewhere in the Conference '87 information. We suggest you make a photocopy of the puzzle so that you can fill it in each month as the clues are revealed. Here are the first four clues:

ACROSS:

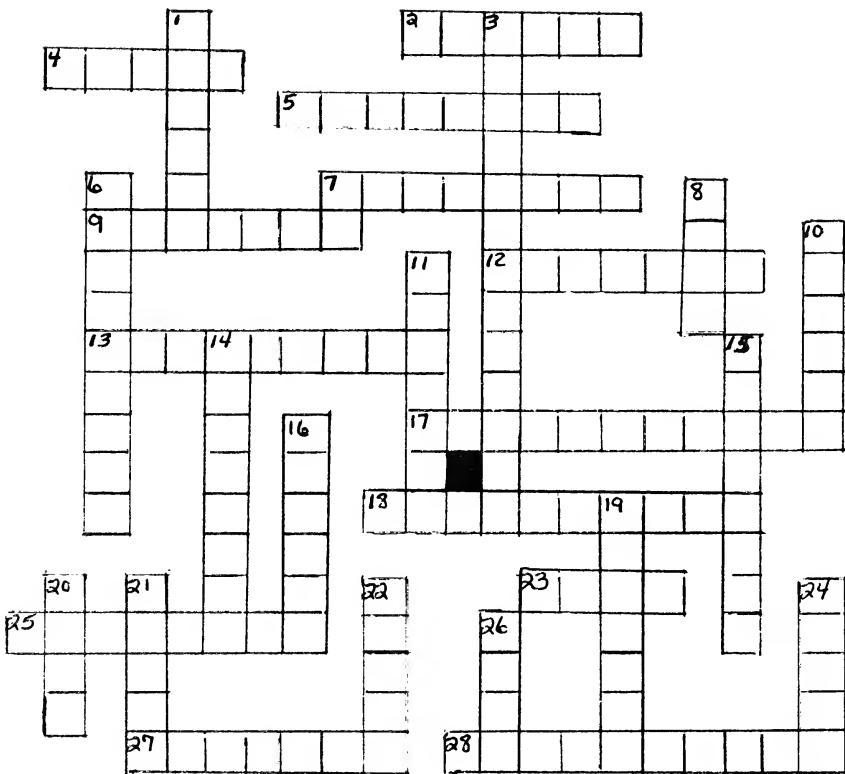
5. Milwaukee County Zoo emphasizes the _____-prey style of exhibition.
23. Parking at the conference will cost how much?
25. Milwaukee is on the shores of what Great Lake?

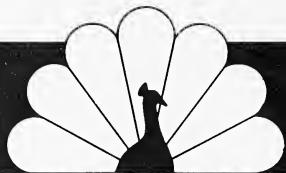
DOWN:

8. Sheraton Mayfair Inn has an indoor heated _____.

Never a Cross-word in Milwaukee...

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Fixed formulation • Economical**

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Chunk and chopped horsemeat,
hearts, livers, rib, shank, and
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Banana flavored primate, 15% protein
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Bulbless heaters—nothing to break.
Safe around all animals and
bedding material.
Even heat distribution in 240, 500,
or 750 watts.

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In Nebraska, call collect 402/488-6492

Animal Spectrum, Inc.
Box 6307
Lincoln, NE 68506-0307

Watch this space for what's new for zoos!

Chapter News

APPALACHIAN CHAPTER

The Appalachian Chapter is pleased to announce the newly elected officers for 1987. They are:

President.....Rosemary Jalink
VP/Treas.....Carolann Curry
Secretary.....Laurie Thomas

Some new activities the Chapter will be involved with this year include AAZK Awareness Day at Mill Mountain Zoo in August and assistance with the Mill Mountain Zoo's Annual Auction. Chapter members will seek donations of items for the auction and Mill Mountain Zoo will split the proceeds of the auction with the Chapter.

The Chapter is continuing its guest speaker programs for the second year. Topics include Alaskan wildlife, exotics as pets, birds of prey, and zoo keeping as a career.

-----Laurie Thomas, Sec'y

PORLAND CHAPTER AAZK

Current officers for the Portland AAZK Chapter, located at Washington Park Zoo are:

President.....Elayne Barclay
Co-VP's.....Michael G. Illig
Bret Sellers
Secretary.....Jan McCoy
Treasurer.....Mike Keele
Chapter Liaison.....Michael Illig

This Chapter's biggest project is the selling of Elephant manure as "ZooDoo". They sell it by the truck load and also can it for gift shop sales. They are currently raising funds for the purchase of a computer for use by the keeper staff. They have also developed a slide show which they take out to local schools illustrating the job of a zookeeper.

TOLEDO ZOO AAZK

Officers for the Toledo Zoo AAZK Chapter are:

President.....Bruce Clark
Vice Pres.....Joanne Terry
Secretary.....Margie Black
Treasurer.....Michelle Grigore
Chapter Liaison...Bruce Clark

The Toledo Chapter continues to feature guest speakers at monthly meetings. Included in past topics have been people from the following disciplines: veterinary, medical, fish/game commission, raptors (falconry), field research, and zoo management. A very successful project has been the Haunted House which the Chapter sponsors for Halloween. Funds generated from this project have been used to sponsor a \$2,000 Chapter grant to fund three Toledo Zoo projects with a "conservation" theme. A T-shirt design contest was also held with the designs of the winners chosen featured on shirts sold in the gift shop.

ZOO ATLANTA AAZK CHAPTER

The Zoo Atlanta Chapter continues to offer two T-shirts for sale: one features their three-year-old African elephant's footprint and sells for \$8.00; the other is a commemorative T-shirt featuring "Willie B.", the Zoo's male lowland gorilla who recently celebrated his 25th anniversary. This shirt sells for \$5.00. You may order either of these shirts by sending necessary size information and check payable to "Zoo Atlanta AAZK Chapter" to AAZK Treasurer, 800 Cherokee Ave. S.E., Atlanta, GA 30315. The Chapter has also been busy gathering materials to send to their adopted keeper in India.

REMINDER REMINDER REMINDER

Has your Chapter sent in its Chapter Information Sheet? Has your Chapter designated its Chapter Liaison? Please do both and let National HQ know.

CHAPTER NEWS, Continued

SOUTH FLORIDA AAZK CHAPTER

The South Florida AAZK Chapter has elected new officers for 1987. They are:

President.....Rachel Rogers
Vice Pres.....Susan Priess
Secretary.....Carol Hesch
Treasurer.....Kim Livingstone

All are keepers at the Metrozoo in Miami. Rachel is a primate keeper responsible for the orang, gibbon, siamang, and black and white ruffed lemur exhibits, as well as off-exhibit primates including red-ruffed lemurs, ring-tailed lemurs and assisting the quarantine crew with primates under their care. Susan is a lead keeper in the Bird Dept. Her primary area of responsibility is in filling in for any keeper in the Bird Dept. and keeping up on changes as they occur in the department. Carol is a bird keeper whose primary responsibility lies in the care of the birds in the brooder hatchery building. Kim is a bird keeper whose primary area of responsibility is in the care of the birds in the aviary. Caring for these birds also requires a daily head count for 300 birds representing 75 species.

----Kim Livingstone, Sec'y

THE VIRGINIA AAZK CHAPTER

Officers for the Virginia AAZK Chapter are:

President.....Terry Walsh
Vice President.....Jon Brangan
Treasurer.....Betty Burcham
Chapter Liaison...Louise LaRoche

The Virginia Chapter is continuing their monthly guest speaker/slide series for members and staff. They are producing "animal track" paintings for sale in the gift shop, are selling blown-out emu and rhea eggs, and are currently making plans to host a "Run for the Zoo" for local runners clubs. Also in their plans are the dissemination of self-guided tour packets to their local public school system.

WELCOME MT. TAHOMA CHAPTER

AAZK would like to welcome the Mt. Tahoma Chapter, made up of keepers from the Point Defiance Zoo & Aquarium. Officers for the newly chartered Chapter are:

President.....Kit Niemann
Vice Pres.....Barbara Osborn
Secretary.....Margaret Gaspari
Treasurer.....Cindy Alia
Chapter Liaison...Marla Waddell

PUGET SOUND AAZK CHAPTER

The Puget Sound Chapter of AAZK recently held its annual elections. The following people were elected to serve one-year terms beginning 1 January 1987:

President.....Phil Pennock
Vice Pres.....Tanya Beverly
Secretary.....Vivian Stewart
Treasurer.....Margaret Girtch

Many thanks to our Elections Officers, Bruce Upchurch and Judie Steenberg, for a job well done.

-----*Nanette Taniguchi
Outgoing Secretary*

GREATER KANSAS CITY AAZK CHAPTER

Current officers for the Greater K.C. Chapter are:

President.....Nancy Griffin
Secretary.....Dale Frerking
Treasurer.....Theresa Cassidy
K.A.L. contact...Dee Wolfe
Chapter Liaison...Dale Frerking

A major Chapter project has been working on funding certain zoo graphics proposed by members and approved by zoo administration. The Chapter has also provided an institutional membership for a zoo in Brazil and a national membership to the mayor of Kansas City.

AAZK 20TH ANNIVERSARY "FOUNDERS WEEKEND"

MAY 5,6,7--1987 San Diego, CA

HOSTED BY THE AAZK HISTORY COMMITTEE

THE PROGRAM---Tuesday, May 5---AN ICEBREAKER at the Holiday Inn
Wednesday, May 6--WORKSHOPS AT THE ZOO AND WILD ANIMAL
PARK--AND A FREE EVENING.
THURSDAY, May 7---WORKSHOPS AT THE ZOO AND WILD ANIMAL
PARK--THEN THE ANNIVERSARY BANQUET
AND AUCTION.
an extra--FRIDAY, May 8----A BEHIND-THE-SCENES TOUR OF SEA WORLD
INCLUDING LUNCH.

WORKSHOPS---This time you can go to any or all of them--it's your choice. They will all be run both days so you don't have to worry about missing anything. Below is a brief description of each.

ZOONOTIC DISEASES---PRESENTED BY Dr. Werner Heuschele--our Zoo Research Director. It will cover everything in our AAZK book and a few more things not mentioned. If you have questions--here's the place to get a good answer.

RESEARCH IN ZOOS (USING KEEPER INVOLVEMENT)--Also given by Dr. W. Heuschele. This one is self-explanatory.

PATHOLOGY---Presented by Dr. Marilyn Anderson, our Zoo Pathology Director. She will have a room set up with a variety of specimens for visual and/or hands on inspection. The "A to Z" on what causes animal deaths and some ways to recognize and even prevent some of the problems.

REPTILES--A special tour of the Reptile House provided by the keepers.

PRIMATES--A special tour of the Great Apes, the Primate Propagation Center, and any other areas you may be specifically interested in.

ELEPHANTS--A special tour and a few other things being dreamed up by our Elephant people at the Wild Animal Park.

CONDORS AND CRANES--Given by Bill Toone, Curator of Birds at the San Diego Wild Animal Park.

TEACHING THE TOUCH--A program with Linda Tellington-Jones, on a new, non-invasive method of rehabilitation, therapy, and stress relief for animals of all types. THIS ONE IS A MUST!!

Conference Registration Form

AAZK 20TH ANNIVERSARY "FOUNDERS WEEKEND"
MAY 5,6,7--1987 SAN DIEGO, CA
Hosted by AAZK History Committee

Please type or print. (One name per form) Return this form with your fee to: Art Goodrich, Mammal Dept., San Diego Zoo, Box 551, San Diego, CA 92112. Please make payment to: Art Goodrich.

NOTE: Deadline for pre-registration is 1 April 1987.

20TH ANNIVERSARY REGISTRATION

NAME _____

ADDRESS _____

CITY _____

STATE _____

ZIP CODE _____

PHONE# () _____

ZOO AFFILIATION IF APPLICABLE _____

VEGETARIAN: YES NO BRINGING AUCTION ITEM: YES NO

ARE YOU INTERESTED IN CONFERENCE T-SHIRT: SIZE: S M L XL
(These are not the "limited edition" T-Shirts...)

REGISTRATION FEE: AAZK MEMBER---\$45.00
NON-MEMBER----\$55.00
LATE FEE-----\$10.00 (After 1 April 1987)

One-day rates for conference events are available: Contact Art Goodrich.

ARRIVAL BY (car, plane, etc) _____ (Let us know if you need pick-up assistance; forward us your arrival date, time and place.)

CHECK THE WORKSHOPS YOU DESIRE TO ATTEND:

Zoonotic Diseases Reptiles

Research in Zoos Elephants

Condors and Cranes Primates

Pathology (a special lab set-up)

"Teaching the Touch" (a program with Linda Tellington-Jones) a non-invasive method of therapy, rehabilitation, and stress relief for all types of animals.

IF YOU HAVE ANY OTHER QUESTIONS: CONTACT ART GOODRICH (at above address) OR CALL (619) 743-5076 AFTER 7:00 P.M. CALIFORNIA TIME. ANSWERING MACHINE AVAILABLE ALSO.

REMEMBER - PRE-REGISTRATION DEADLINE IS 1 APRIL 1987

Hotel Reservation Request

AAZK 20TH ANNIVERSARY "FOUNDERS WEEKEND"

MAY 5,6,7--1987 SAN DIEGO, CA

Please check desired room type and rate. Rooms are held until 4:00 p.m. of arrival date. Credit card guarantee or deposit is advisable.

Room type (please check):

Single room (one person) ---\$60.00

Double room (two people)---\$66.00

Please check:

Guaranteed reservation (arrival after 4:00 p.m.)

Requires: Credit Card name _____

Credit Card number _____

Expiration date _____

OR Deposit (one night's stay)

4:00 p.m. arrival or prior.

If no arrival time is indicated, rooms will only be held until 4:00 p.m.

NAME _____

SHARING with _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

ARRIVAL DATE _____ HOUR _____ (am/pm)

DEPARTURE DATE _____ HOUR _____ (am/pm)

GROUP AFFILIATION: AMERICAN ASSOCIATION OF ZOOKEEPERS

Send this completed form to:

HOLIDAY INN, MISSION VALLEY
595 Hotel Circle South
San Diego, CA 92108-3496

ATTN: Chetta Parli

Zookeepers Conference

IF YOU DESIRE TO PHONE YOUR RESERVATIONS, CALL: (619) 291-5720. Ask for SALES Department.

AAZK Regional Coordinators

Co-Directors Regional Coordinator System

States East of Mississippi - Diane Krug, Rt. 1, Box 273, Hilliard, FL
32046. (904) 225-9559 (work)
(904) 845-4279 (home)

States West of Mississippi - Debbera Stecher, Woodland Park Zoo, 5500
Phinney Ave., North, Seattle, WA 98103
(206) 625-5402 (work) (206) 745-8198 (home)

REGIONAL COORDINATORS

John Linehan, Franklin Park Zoo, Boston, MA (617) 442-7646 (w)
for the states of ME, VT, NH, MA, RI, CT

Peter Buchholz, Bronx Zoo, New York (212) 220-5154 (w) (718) 229-7711 (h)
for the states of NY, VA and the District of Columbia

Denise Robinson, Philadelphia Zoo, Philadelphia, PA
for the states of PA, DE, NJ, MD

VACANCY - for the states of TN, NC, SC, W. VA

VACANCY - for the states of MI, IN, KY and OH

Larry Sammarco, Lincoln Park Zoo, Chicago, IL (312) 294-4660 (w)
for the states of WI, IL, MO, MN, IA

Tim Kurkowski, Zoo Atlanta, Atlanta, GA (404) 624-5600 (w) (404) 428-0535 (h)
for the states of GA, AR, AL

Marcelle Guidry, Greater Baton Rouge Zoo, LA (504) 775-3877 (h) (504) 388-
for the states of LA, MS 9392 (h)

Vikki Bohnert, 2264 Winkler Ave., B-11, Ft. Myers, FL 33901
for the state of Florida

John R. Turner, Denver Zoo, Denver, CO
for the states of CO, NM, TX

Steve Tigges, Tulsa Zoological Park, Tulsa, OK
for the states of OK, NE, KS, ND, SD

Laurence Gledhill, Woodland Park Zoo, Seattle, WA (206) 625-5497 (w)
for the states of WA, OR, ID, MT, WY, AK

Art Goodrich, San Diego Zoo, San Diego, CA
for the states of CA, NV, UT, AZ

Honolulu AAZK Chapter (Dan Vitiello, Pres.) (808) 923-4772 (w)
for the Hawaiian Islands

Neville Howard Pike, Metro Toronto Zoo, Box 280, West Hill, Ontario M1E 4R5
for the Province of Ontario, Canada

Bob Debets, Assiniboine Park Zoo, 2235 Corydon Ave., Winnipeg, Manitoba
R3P 0R5 (204) 489-3893 (h)
for the Province of Manitoba, Canada

Marcia Rasmussen, Calgary Zoo, P.O. Box 3036, Stn. B., Calgary, Alberta
Canada, (403) 235-5461 (h)
for the Provinces of Alberta and British Columbia, Canada

Need membership information? Want to learn more about AAZK or start a chapter or become more active - then call your RC! There are still openings for RC positions for (1) the states of TN, NC, SC, W. AV) and (1) the states of MI, IN, KY, OH. If you are interested, please contact Diane Krug, Eastern U.S. Regional Co-Director. You may call Diane collect at her home phone (904) 845-4279) evenings after 6 p.m. EST. These two positions offer a great opportunity to become involved in AAZK and to provide a valuable and necessary service for the Association.

CHAPTER NEWS, Continued

FLINTHILLS AAZK CHAPTER

This AAZK Chapter, located at the Sunset Zoological Park, Manhattan, KS, is currently working on renovating the zoo's pheasant exhibit and also cataloging books in the zoo's library. Current officers are:

President.....Zoe Albers
Vice Pres.....Mike Quick
Secretary.....Peggy Hopkins
Treasurer.....Mary Haines

TOPEKA ZOO AAZK CHAPTER

Current officers are:

President.....Piper Kimball
Vice Pres/Chapter Liaison....
Tori Mason
Secretary.....Mike Yznaga
Treasurer.....Alice Miser

The Chapter is currently raising funds to redecorate their Keeper Center (break room). They are also considering trying to get Gary Larson ("The Far Side" cartoon's creator) to come for a visit to speak and autograph his work.



NO LION: CREATIVE MARKETING LIVES IN TULSA

By
Steve Tigges, Keeper
Tulsa Zoo, Tulsa, OK

In October of 1985 an idea sprang up at a lunch table on what to do for that year's Christmas party. Since it is customary for the keepers and docents of the Tulsa Zoo to supply some sort of entertainment at their yearly Christmas party, ideas starting bouncing from person to person.

One of the entertainment participants from the party the year before suggested that since the women from the keeper and docent staff lip-synced the song "Stop In The Name Of Love", and dubbed themselves The Zoopremes, that the men partake in that year's entertainment. With a lot of coaxing, six volunteers - 4 keepers, 1 police officer, "a keeper husband" and 1 accountant, "a docent's friend, put together a lip-sync group that grew beyond their "wildest" expectations. Many hours of practice took place before their December debut. After two or three shaky practices enough songs were gathered. The six members, with help from the original supporters, decided on 60's music, that Big Chill era that most of them had grown up with. Some of the songs selected were: "My Girl", "Runaround Sue", "Ragdoll", "Good Lovin" and "Shout".

The idea was there, the songs had been picked, but they needed something more - they needed to name their lip-sync group and they needed to come up with a gimmick. Finally it came to them - let's call ourselves The Zoos Brothers and dress like the Blues Brothers, a rhythm & blues revival band that was performed by comedians Dan Akroyd and the late John Belushi. The Blues Brothers had a mission: to raise money to save an orphanage. The Zoos Brothers also have a mission: that being to promote the new Tulsa Zoo. At first promoting the Tulsa Zoo in this capacity was the furthest thing from their minds. The original idea was to perform once and only once. But their surprise, the Zoos Brothers were a hit at the Christmas party.

NO LION: CREATIVE MARKETING LIVES IN TULSA, Continued

The Christmas party that year was held at the Knights of Columbus Lodge. Members of the lodge witnessed the performance and the audience's enthusiastic response. The Knights asked if the Zoos Brothers would perform the following week at the lodge for their Christmas party. The six members reluctantly said yes. Since those performances, the six have performed 15 times at various clubs and other locations in Tulsa and for social functions at the Tulsa Zoo - always incorporating into their act an invitation to visit and support the Tulsa Zoo.

After winning a local lip-sync contest, the Zoos Brothers aimed high and entered the local Puttin on the Hits contest. Competing against a hundred different acts, the Zoos Brothers performance was full of so much energy and enthusiasm that almost everyone in the mall where the contest was held was standing and clapping and yelling "Zoos Brothers, Zoos Brothers". That enthusiasm sailed the Brothers to first place.

A few months following their contest win, the producers viewed their taped performance and called and wanted the six lip-synners in Hollywood for the nationally syndicated show. On December 20, 1986, the Zoos Brothers embarked to Hollywood, expenses paid, and performed against tough competition. The outcome will be televised the week of March 30th, 1987. So check your local listings for times and dates. The Zoos Brothers claim their owe their confidence to their fellow keepers, management and docents for all their support.

Their goal orginally was just to have fun. But now they recognize that they can play a positive role for the Tulsa Zoo and still do something "wild".



THE ZOOS BROTHERS - from left to right: Rusty Grimpe, Stephen Walker, Steve Tigges, Jack Hanna (Honorary Zoos Brother), Paul Louderback, Daryl Shores and Kerry Barnett.



CALIFORNIA CONSIDERING MOUNTAIN LION TROPHY SEASON

The California Fish & Game Commission will begin a series of three hearings this month on a proposed trophy hunting season on mountain lions. California mountain lions were protected by a legislatively mandated moratorium on trophy hunting since 1972, but this protection expired on 1 January, because Governor Duekmejian vetoed legislation in 1985 that would have continued protections for the lions. This year mountain lions were given a reprieve as enormous public opposition to the reinstatement of a lion hunting season and the political climate of an upcoming election forced the Fish & Game Commission to defer a hunting season for one year. The one-year deferral is almost over and, like the hearings held in 1986, the Fish & Game Commission will once again hear proposals from sportsmen urging a statewide hunting season on mountain lions.

Attempting to capitalize on the unfortunate and tragic attacks on two children in Orange County, trophy hunting enthusiasts are trying to convince the public that lions are a threat to public safety and that the lion's already limited population must be further reduced by "sport" hunting. (Except for these two attacks in Orange County, there have been no other mountain lion attacks on humans in California since 1909.)

Existing law and Fish and Game Commission regulations give the State's wildlife agencies sufficient authority to protect the public from wildlife attacks. In addition, for the past four years, the Department has implemented a depredation control program to protect the livestock industry from limited mountain lion depredation. Currently the Department, the County of Orange, and the Audubon Society are undertaking a study in the Orange County park where the two children were attacked in order to determine the cause.

The mountain lion is a symbol for the few remaining wild and remote places that still exist in California. A sport hunting season will only provide a few individuals the opportunity to shoot one of California's last remaining wild and majestic predators according to The Mountain Lion Coalition, a environmental group opposing the proposed trophy season.

The first hearing was held in Long Beach on 6 February. Two more hearings are scheduled and the Coalition urges those concerned with the mountain lion's fate in California to attend these meetings. The remaining two hearings are scheduled as follows:

- 6 March - Redding, CA (9:00 a.m., City Council Chambers, 1343 West Ocean Blvd.)
- 3 April - Sacramento, CA (9:00 a.m., Resources Building Auditorium, 1416 Ninth St.)

If you cannot attend the hearing, but would like the Commission to consider your views you can write to the Commission at: California Fish & Game Commission, 1416 9th St., Sacramento, CA 95814. For further information you may call either (213) 457-LION or (916) 442-2666.

If you would like to contribute to the informational and educational work of the Mountain Lion Preservation Foundation, please send your tax-deductible donation to:

Lion Preservation Fund
P.O. Box 1896
Sacramento, CA 95809



Joys of Convention Fundraising
Or
A Weekend in Hell

By
Ed Hansen, Keeper
Reid Park Zoo, Tucson, AZ

Even now, as some of you plot and plan, scrimp and save, in order to attend the 13th National Conference in Milwaukee, the Tucson Chapter of AAZK diligently pursues every available fund-raising opportunity we can think of, to put on a memorable conference in 1988. Some of the fund-raisers are turning out to be memorable also.

The Chapter has always had good luck in the past with raffles. We would solicit donated items or hand-made crafts made by chapter members, and sell chances for one dollar, always realizing a nice profit. So Gale came up with the idea of purchasing Mr. and Mrs. Santa Claus dolls beautifully handcrafted by the wife of a senior keeper at Reid Park Zoo, for the purpose of raffling them off at the "4th Avenue Street Fair" - a pre-Christmas event attended by tens of thousands of bargain shoppers. Even as I write this, I am still trying to think of a reason to blame Gale for a good idea, one that went straight into the toilet. I can't blame her, but I'm still trying.

I should have realized immediately that good things were not going to happen for the Chapter when arrangements made for the street fair collapsed. The more level headed members of the Chapter suggested that we wait until next year. I said no we would pursue an alternative. They called me stubborn, with which I can't argue. I suggested the senior citizens' "Sun Fair". Rusty and Gale were confident. The rest expressed guarded reservations, anywhere from voiced skepticism to uncontrollable laughter. As time for the Sun Fair grew near, and being faced with having to sell enough raffle tickets to pay for the dolls, the maker generously offered to buy them back. I consulted with the diehards, and we decided to go forward with the raffle. Everyone else questioned my sanity, which does tend to happen more often than not.

Fittingly, on the first day of the outdoor Sun Fair, it poured rain. Everyone was quickly stuffed inside a dance hall. Rusty, whose previous life was spent as a carnival barker; Gale, who felt obligated to help in defense of her idea; George and his new wife Diane, demonstrating how quickly boredom invades a marriage; and Karen, who is reasonable enough to deal with anything, sold tickets on Saturday. I was to sell tickets alone on Sunday. Rusty called Saturday night with the details. I couldn't hear a word he said over the fits of laughter coming from Gale in the background. Rusty mumbled one word over and over - old.

Ah Sunday. I arrived quietly with Mr. and Mrs. Claus tucked under each arm to find our table set up in a dark corner. This, I discovered, was because Rusty kept drowning out the polka bands with his raffle spiel. It was at this time that I suddenly realized that I was the only person in a room of 500 people that was under the age of 62. My first impression of the Sun Fair was that I should have taken advantage of those CPR courses that the City offers. It didn't take long to realize that senior citizens would rather spend their pension dollar on a crocheted toilet paper cover than a raffle. Rusty must have really twisted some calcified elbows to sell as many tickets as they did.

JOYS OF CONVENTION FUNDRAISING, Continued

Some lady ran over my toes with a motorized wheelchair, and by 11:00 a.m. I would have traded Mr. Claus for a warm beer. Now I know Zookeepers tend to have avery graphic and descriptive conversations, but nothing compared to the gems I overheard about human bowel movements, or more precisely, the lack thereof. You would be amazed at the number of things that can go awry with the pancreas. Then, the entertainment started. You have not fully experienced life until a 200-pound, 80-year-old woman in spandex pants, with a pillow stuffed under her blouse to make her look 10 months pregnant warbles "I'm just a girl who can't say no". By one o'clock I thought of arranging Mr. and Mrs. Claus in various positions of the Karma Sutra, just for shock value, business was slow.

I sat through thirteen verses of Beer Barrel Polka, in three languages. I kept repeating to myself - for the good of the Chapter, for the good of AAZK, all the while fully realizing this was why the Winnipeg conference coordinators were pictured in the AKF cartoons wearing straight jackets.

By 2:00 p.m. I was grinding my teeth so hard I was having a hard time hearing an 82-year-old man sing "New York, New York" in a falsette voice so high it would crack a glacier. By 3:00 p.m. I was grinning like an idiot and tapping my feet in time to a medley of Wayne Newton classics. People were starting to buy tickets on the basis of sympathy. By 4:00 p.m. I was comatose. I had come face to face with my future and it was severely wrinkled.

Twas time to go. Raffle hastily completed, I ran screaming from the room, out to my truck to discover an advertisement tucked under the wiper blade for a homemade, fruit-filled prune log. Oh boy. Stopping briefly for two quarts of beer and a small bottle of aspirin, I arrived home and spread the loot on the bed to make a quick tally of the profits, and call the Zoo to spread the good news to my co-workers. Subtracting the total cost of the dolls from the total collected, minus the \$10.00 Rusty took to mail materials to our sponsored keeper in India, we made \$5.00. That, plus 95 cents would buy us the Prune Log, which by 1988 would probably taste as good as it ever would.

So, as you can see, the Tucson Chapter is already hard at work raising funds for the 14th National Conference. So after you make plans to attend Milwaukee this October, be sure and start thinking of Tucson in '88. I don't think the Chapter is going to let me suggest anymore fund-raising ideas, so the conference should be better than ever.

I know...we can do the Prune Log at the live auction....



Information Please

Information needed concerning the diets given to Indian Sloth Bears (Melurisis ursinus). Please contact: Ric Urban, Sunset Zoological Park, 11th & Poyntz, City Hall, Manhattan, KS 66502.

Public Education Committee

THE LASAGNA THEORY OF PUBLIC EDUCATION

An Introduction By Jay Jasan, Chairman AAZK Public Education Committee

More and more zoos today employ graphic artists who are responsible for the layout and production of brochures and informational signage. Many zoos, however, are not able to include a graphics department on their payroll and the task of producing interpretive signage is left to someone else.

On occasion, Keepers have pitched in and devised successful signage systems for their zoos. Keepers often have a good sense of what the zoo visitor would like to know about their charges, and have ideas about what visitors should know about them. Very often, this results in a sign that contains too much information for the visitor to read, and informative signs may be completely ignored. In his book, Interpreting Our Heritage, Freeman Tilden explains that we need to "provoke rather than instruct". What he is saying is that instead of attempting to present an exhaustive amount of information about a topic or specific animal, simply present enough information to tempt the visitor into learning more.

Linda Taylor, Curator of Exhibits and Displays at the San Francisco Zoo, presented an interesting approach to this problem at the 1981 Annual AAZPA Conference. The following is an excerpt from her presentation which was entitled "Gorilla Gorilla Gorraphics".

"The Lasagna Theory of Public Education"

People consume information much like they consume food. Especially in the zoo situation, they seem more willing to make a meal of many delectable tidbits of data, than sitting down to one heaping helping of it. Clearly too, there is a finite number of things people will participate in. They tend to spread their participation across the zoo and throughout the day.

Our intention at Gorilla World was to create an invitation to nibble, in the hopes that people would lick the plate clean, looking for more. My own experience at other zoos, museums and aquariums produced the uncomfortable feeling that sometimes graphics are designed to satisfy the collective scientific conscience of the institution's curatorial staff, rather than the general public.

What does all this have to do with lasagna?

Only this: Presented with your favorite food on a saucer, you'd tend to eat it all. If I fill a small bowl of it, you'll probably still wolf it down. Now, if I fill a very large plate, you'll most likely start to pick. And if I present you with the whole casserole, chances are you're going to eat less than you would have from the saucer. Why? Because I've delivered to you more lasagna that you can possibly digest--at least without considerable discomfort. Worse yet, I may have ruined your appetite entirely!

In terms of public education in zoos, when determining the menu and portions, it's essential to remember that people are visiting us primarily to enjoy a nice day outdoors, in the presence of creatures they have no access to anywhere else. They didn't come to read. They didn't come to

THE LASAGNA THEORY OF PUBLIC EDUCATION, Continued

to be distracted from the animals. On the contrary, they want to get as close to them as possible. They want to connect somehow, which may explain the public irresistible desire to feed. For educators the way to produce a sense of closeness is to turn the people on to something they didn't already know, or help them see what's before them with a little more insight, thereby sponsoring a new understanding of animals out of which grows respect, and YES, that wonderful sense of connection!

One way of doing this is to make the informational platter so very appealing, the public's appetite for more information is sparked, but never overwhelmed. Besides limiting the portions and going easy on the vegetables, there are other things we can do to make the plate tempting.

We can add humor. Vary the language. Consider the position of the panels in respect to the exhibit itself. We can also vary the context of the information. At Gorilla World, sometimes you read. Sometimes you poke your head through a hole. Sometimes you use your whole body--sometimes, just your hand. Basically, our goal was to surprise the public every chance we could. At the same time, it was important to remember that surprise and confusion are often first cousins. In an effort not to lose the connective tissue between each graphic, we made them all relatively the same size, with the same typefaces and comparable palates of color, which helped achieve visual continuity.

Just as important was a continuity of mood. We all agreed that the best graphics seemed to have literally floated onto the panels, with no sign of struggle. Even though we behind the scenes know that good graphics often take months of hard labor, they should look like they were conceived in one night on flawlessly-ironed bedsheets, and borne without the slightest shriek.

Post-Script to "The Lasagna Theory of Public Education"

If this article has provoked you into wanting to learn more about signage and public education, the following are a few books that would be a good start.

Interpreting Our Heritage. Tilden, Freeman. University of North Carolina Press, Chapel Hill, NC. 1977.

Making Exhibit Labels. Serrell, Beverly, American Association of State and Local History, Nashville, TN. 1983.

The Interpreter's Handbook. Grater, R.K. Southwest Parks and Monuments Association. 1976.

Interpreting the Environment. Sharpe, G.W., John Wiley and Sons, New York. 1976.

Interpreting for Park Visitors. Lewis, William J., Eastern National Park and Monument Association, Independence Agency, Philadelphia, PA. 1981.



SURVIVAL OF HAND-RAISED HOOFSTOCK

By

Karla J. Michelson, Senior Keeper
Infant Isolation Unit
San Diego Wild Animal Park
San Diego, CA

Hand-raising exotic hoofstock can be an exciting and rewarding experience, especially when the youngsters raised produce their own offspring someday. But what happens to those that aren't so lucky?

Introduction of hand-raised animals into a large field exhibit at an early age has become a growing concern. This is a problem unique to zoos and institutions with large enclosures that house several different species of animals. Recent studies done at the San Diego Wild Animal Park concerning the survival of hand-raised neonates upon release in a field-type enclosure, showed that the following elements are directly involved and should be evaluated in juvenile field releases.

- 1) Age/size
- 2) Species involved in release
- 3) Exhibit stressors

Statistics gathered on 62 juvenile hoofstock, hand-raised between 1981 and 1986 at the Wild Animal Park's Infant Isolation Unit, demonstrate the significance of these factors.

The most relevant calculations revealed that the age at time of release was directly related to that animal's chance of survival in the exhibit. Facts revealed that those neonates released under four months of age had only a 1 in 3 chance of survival*, or a 66% mortality rate. The data also showed that the chance of survival dramatically increases nearly 100% when released after four months of age, with most individuals surviving several years after that initial first year in the exhibit. The conclusion drawn from these facts substantiates that the development of the neonate after that critical age of four months allows it the chance to overcome many stressors present in its new environment.

Further information showed that some species of hoofstock fared better than others when released earlier than four months of age. Of two cervidae nine antilopinae released before four months of age less than 50% survived, whereas of eight juvenile captinae and saiginae released less than four months old, only 12% survived. Also noted when raising a variety of species, each had a unique temperament that dictated its dependency or psychological attachment due in part to the human bond formed in hand-rearing situations. This can create adjustment problems for the neonate upon release into an exhibit where minimal human interaction ensues. Each species handles this factor in different ways.

In general, some species such as the saiga antelope, sitatunga, and addra gazelle become aloof and indifferent shortly after weaning when human contact has become minimal. This allows for a shorter adjustment period upon release.

*Survival is defined as those surviving one year of age or more.

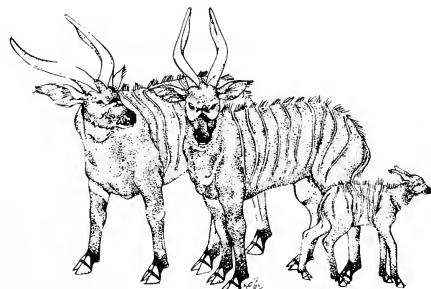
SURVIVAL OF HAND-RAISED HOOFSTOCK, Continued

Species such as Thomson's gazelle, slender-horned gazelle, and muntjac remain friendly and affable with humans often up to a year or longer after they are weaned which sometimes slows down their adaptation to the exhibit.

Last, exhibit stressors play a large part in a young animal's chance of survival. Stressors in field enclosures include pressure and harassment from other exhibit members, and possibly competition with other herd members. The most common cause of mortality in our experience being harassment that results in trauma to the neonate.

Another problem in field introductions creating stress is herd acceptance. It is important for the juvenile to join the herd as soon as possible, for the herd offers a certain degree of protection to its young members. Therefore, the ultimate goal in an exhibit introduction is for the young animal to bond with its own species to become a viable herd member. Sometimes for the hand-raised neonate, certain difficulties can arise. Typically, a species such as an ellipsen waterbuck has been raised together with other unrelated species, such as sika deer which is often the case in zoo nurseries. The ideal situation is for the neonate to be raised with individuals from a similar family which will hasten recognition of its own kind once released. If this cannot be done, the juvenile's rate of herd recognition may be retarded. Reduction, in part, of any of the aforementioned stress factors greatly increased the neonate's chance of survival.

In conclusion, we believe that to increase the hand-raised neonate's chance of successful reintroduction to large, mixed-species exhibits like those at the Wild Animal Park, two basic principles should be employed: 1) sufficient time for the animal to gain the maturity needed to better handle the many exhibit stressors when they are eventually released back into their respective exhibits, and 2) have an intermediate area in which to house the juvenile upon weaning where it will receive minimal human contact thus permitting some reduction in its psychological dependence. Attention to these two areas should result in increases in the survival rate of hand-raised neonate hoofstock.



on the brink of EXTINCTION

Everyone receiving this newsletter is aware of the crisis facing the wild rhinos. In Kenya alone, wild populations have dropped from 20,000 black rhinos in 1970 to about 350 today. Only about half of these are on sanctuaries.

One such sanctuary is Ngare Sergoi at Lewa Downs, where Englishwoman Anna Merz, using her own funds, has fenced and staffed a 5,500-acre preserve for 12 black rhinos. Since the beginning of Ngare Sergoi in 1983, five babies have been born and poachers have been repulsed near the fenceline. This has been accomplished with no government support and little other outside assistance. However, the sanctuary is nearing its carrying capacity, and Anna's personal funds are nearly exhausted.

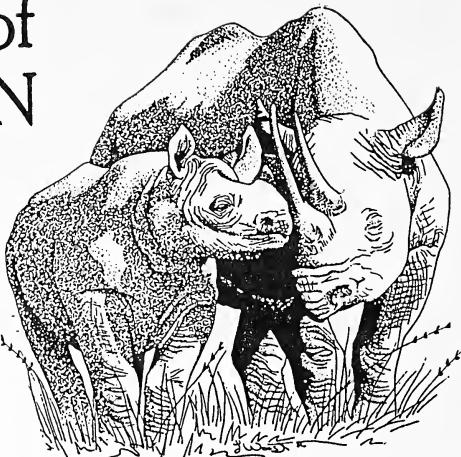
In the spring of 1986, Columbus Zoo pachyderm keeper Andy Lodge spent six weeks at Ngare Sergoi, working with Anna and conducting a field study of the rhinos. Since his return, with the backing of the Columbus AAZK Chapter, Andy has been telling Anna's story and attempting to raise money to help keep her program going.

Armed with slide shows and his first-hand experiences on the preserve, Andy has given talks at several zoos in the United States and Canada and for local groups. There is no speaker's fee. The focus of the talk is on the plight of the wild rhino, the causes of the problem, what must be done, and the work being carried on by Anna at Ngare Sergoi. Andy is constantly in touch with Anna and provides updates on conditions at the preserve.

For more information about Ngare Sergoi or having Andy give a talk at your zoo, call Andy Lodge at the Columbus Zoo: (614) 766-3400.

Contributions to Anna Merz can be made by sending a check (payable to Columbus Chapter AASK) to: Rhino Fund, c/o AAZK, Columbus Zoo, Box 400, Powell, OH 43065-0400.

The rhino has existed for nearly 60 million years and included some 170 species. Today, there are only five species remaining worldwide, including the Indian (about 1700), the Javan (about 65), the Sumatran (about 500), the southern white (about 3,000), northern white (about 18), and the black (about 3,000). The rhino was chosen as the symbol of the AAZK in 1967 because it represented strength, persistence, determination, and presented a defined image of survival. Can we afford to let extinction be its ultimate fate?



"THERE'S NOTHING IN THIS CAGE!"

Lemming Activity

By

Ted Daehnke, Animal Keeper
Washington Park Zoo, Portland, OR

Observers of Washington Park Zoo's lemming exhibit were not always able to locate any lemmings. In an attempt to rectify this situation, the decision was made to determine what activity patterns existed and what variables influenced activity. This information could then be used to predict or modify lemming activity in the exhibit.

Batzli, White, MacLean, Pitelka and Collier (1980) reported that Brown Lemmings reach maximal hunger at two hours and an empty gut at three hours. Kock (1964) reports periods of extensive activity in late morning and later afternoon/evening for captive lemmings. These reports are not necessarily in conflict. Quick trips to the food bowl every couple of hours might go unnoticed while longer periods of activity involving foraging of exhibit plants, social interaction or sunning would be more obvious. The longer periods of activity would be more significant in an exhibit situation.

The present project was undertaken to provide quantitative data on lemming activity patterns. By recording lemming activity levels and values of temperature, weather, and time of day, any correlation between activity and these variables could be demonstrated.

It was expected that the lemmings would avoid wet weather because their fur is not waterproof (Batzli et al., 1980) and that activity would cluster around particular times of the day as observed by Kock (1964). Beyond this no predictions were made concerning what conditions might lead to an increase or decrease in lemming activity.

METHOD

Subjects

One Brown Lemming (*Lemmus trimucronatus*) overwintered in the outdoor exhibit and was the subject of the first series of observations. The second series of observations involved a pair of Brown Lemmings which may have included the original subject.

Apparatus

The exhibit measures 4.6m x 6m with an additional 1.2m x 3m occupied by a concrete stairwell at the back. It is enclosed by wire mesh on top, back and left side. The front is glass and the right wall is concrete. The ground slopes from back to front with terracing creating about 20% level ground. The lemmings made no use of the stairwell and 95% of the rest of the exhibit was visible from the observer's position. During the first series of observations the ground was covered by dead plant material which sometimes made locating the lemming difficult. Between the two series of observations the exhibit was raked and the plant material present during the second series of observations did not obscure view of the lemmings.

"THERE'S NOTHING IN THIS CAGE!" - Lemming Activity, Continued

Procedure

Observations - Between 5 February 1986 and 26 February 1986, 45 hours of observations were recorded in blocks of 1 to 3 hours. Between 23 April 1986 and 22 May 1986, 39 hours of observations were made in three-hour blocks. Observations were evenly distributed between 0800 hours and 1700 hours Pacific Standard Time. At 5-minute intervals the exhibit was scanned and observations recorded. Temperature was recorded at 30-minute intervals.

Variables - In the first series of observations the lemming was recorded as active if visible above ground and not active if not visible. Time of day, temperature and weather were recorded. Weather was classed as sunny, cloudy or raining. Any condition which placed the exhibit in shade was classed as cloudy.

RESULTS

Of the first series of observations the lemming was active 20.3% of the time. Separating the observations into the three weather classes provided the information that the lemming was active 28.8% of the time when it was sunny, 17.1% of the time when it was cloudy and 1.7% of the time if it was raining. Of the second series of observations, one or both lemmings were sighted 66% of the time. A single lemming was sighted 40% of the time and both lemmings were sighted 19% of the time. The number of lemming sightings was 42% of the maximum possible. Sightings during sunny conditions were 43% possible, 42% of possible during cloudy conditions and 40% of possible in the rain.

Each series of observations was sorted by temperature. The number of observations in each temperature class was multiplied by the appropriate activity level (.203 for first series classes and .42 for second series classes) to yield an expected number of sightings. The number of sightings in each temperature class was divided by the expected number of sightings to produce a percentage of expected. First series percentages ranged from 0 to 400 and second series percentages ranged from 74 to 138. In both cases no pattern was evident. (See Figure 1)

Observations were also sorted by time of day into one-hour intervals. A percentage of expected was again calculated. First series results ranged from 30% to 220% with no apparent pattern. Second series results ranged from 81% to 125%. A peak in activity appeared to exist between 1000 hours and 1300 hours with a second peak beginning at 1600 hours. (See Figure 2)

DISCUSSION

Activity in the second series of observations was more than twice as common as it had been in the first series. A number of inaccuracies could have been attributed to this difference. Dead plant material was cleared from the exhibit between the two series of observations. Poor visibility might have depressed the number of sightings in the first series. A second factor that might have affected accuracy is reproductive activity. Halfway through the second series of observations a litter of three lemmings started appearing above ground. There was no chance of mistaking them for the adults and they are not counted in the sightings, but activity by the adults due to breeding and then raising the young may have distorted the results. A third factor leading to inaccuracy is simply sample size. Only one lemming was represented in the first series of observations and only two in the second series. A sample this small has a hard time disregarding individual variation. In spite of these

FIGURE 1

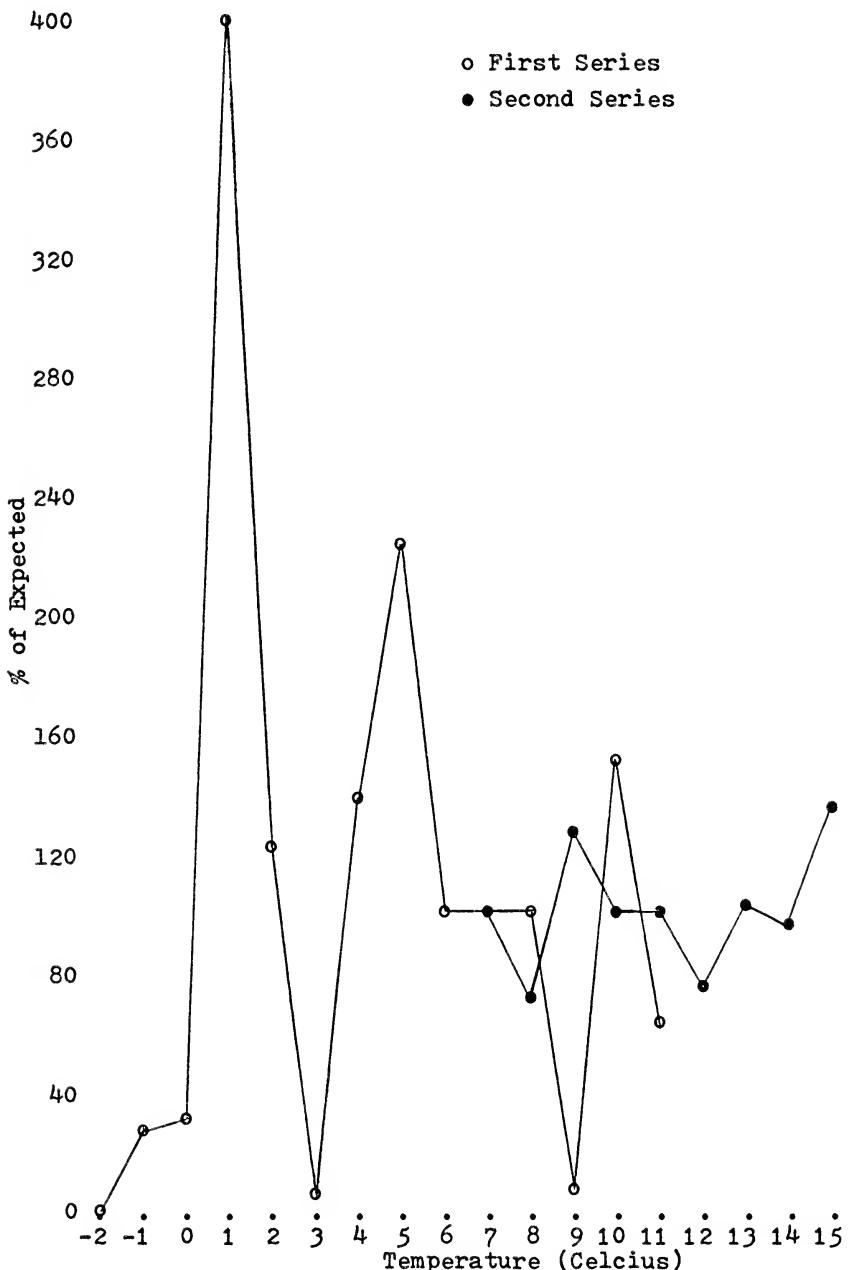
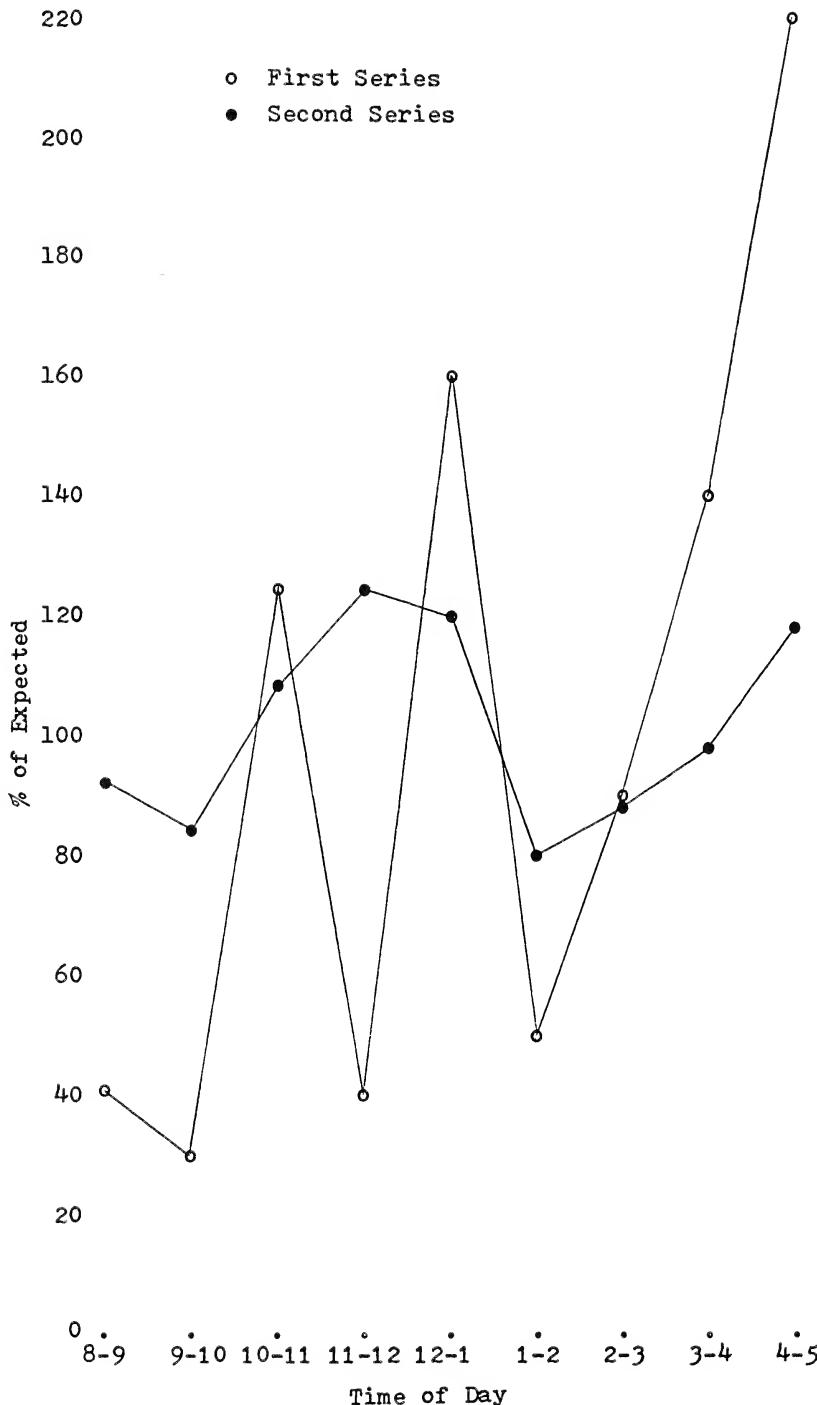


FIGURE 2



"THERE'S NOTHING IN THIS CAGE" - Lemming Activity, Continued

problems, the difference between the two series is large enough to suggest a seasonal variation in activity levels. A seasonal variation is also suggested by the casual observation that activity seems to have decreased significantly again in early October 1986.

There was a remarkable difference in the lemmings' reaction to rain in the two series. In February rain was almost completely avoided, but in May activity was evenly distributed through all types of weather. Temperature might be a big factor in the lemmings' reaction to rain. At the cold temperatures predominant in February, wet fur would be a serious energy loss and health risk. At the higher May temperatures wet fur may not be as important.

Temperature did not seem to be a factor influencing activity within a series, but may explain the higher level of activity in the second series. First series temperatures ranged from -2°C to 11°C. Second series temperatures ranged from 7°C to 15°C. At the lower temperatures the lemming may be keeping activity to a minimum, balancing energy gain from foraging against energy loss from exposure to surface conditions.

The first series daily activity pattern did not conform to the pattern observed by Kock (1964), but second series observations did. Temperature gains may have accounted for the differences. At low temperatures the lemmings' activity may conform to Batzli's (1980) observations. Activity would result only under the pressure of hunger and would be evenly spaced throughout the day. At higher and presumably more comfortable temperatures the lemmings could engage in more discretionary activity. This additional activity seems to conform closely to the pattern observed by Kock (1964).

The results indicate that a) 1000 hours to 1300 hours PST is the best time for viewing lemmings and b) rain protection might increase winter activity. Two litters of 3 and 2 lemmings led to a population of 7 and excellent viewing this summer. We hope the new clear roof will make lemming viewing a year-round activity.

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Institutions wishing to advertise employment opportunities are asked to send pertinent data by the 15th of each month to: Opportunity Knockers/AKF, 635 Gage Blvd., Topeka, KS 66606. Please include closing dates for positions available. There is no charge for this service and phone-in listings of positions which become available close to deadline are accepted.

ZOOKEEPER...ambitious person needed to handle diverse exotic small animal collection. Avian and/or herpetological expertise emphasized. Requires associate degree in Animal Science, BS degree in biology or related field preferred. One year paid zoo experience desired. Salary \$10,000-\$11,000 plus benefits. Send resume by 20 March 1987 to: Laura Trechsel, General Curator, Folsom Children's Zoo, 2800 A Street, Lincoln, NE 68502 EOE.

ANIMAL KEEPER/MAMMAL DEPT...at Baltimore Zoo. Salary \$13,314. Each candidate must have graduated from an accredited high school and have one year paid experience in the care and handling of a variety of mammals, excluding pets; or have graduated from an accredited high school and have 6 months experience in the care and handling of animals in a zoological institution; or have a bachelor's degree from an accredited college or university in biology, zoology, animal science or veterinary technology. Eligibility for a driver's license is required. This is an entry level position under the direct supervision of a Senior Keeper and/or Curator. All resumes to be sent to Sandra Kempske, Curator of Mammals, Baltimore Zoo, Druid Hill Park, Baltimore, MD 21217. Deadline for acceptance of applications is 28 February 1987.

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ELEPHANT HANDLER...experience with elephants required. Will participate in management husbandry and breeding programs for both Asian and African elephants. Will also be involved in elephant training demonstrations and elephant rides. Send resume and references by 1 April 1987 to: Charlie Gray, African Lion Safari, R.R. 1, Cambridge, Ont., Canada N1R 5S2.

KEEPER/SCZ BREEDING FARM...requires some zoo experience or related work experience. A farm background preferred. Will assist in the maintenance and care of approximately 100 mammals and birds. Salary: \$6.31/hr, plus benefits. Submit resume by 1 March 1987 to: Mark Reed, Assistant Director, Sedgwick County Zoo & Botanical Garden, 5555 Zoo Blvd., Wichita, KS 67212.

ANIMAL TRAINER...responsible for continuation and further development of training and demonstration program for sea lions, birds of prey, and other species. Will participate in the care and maintenance of training animals and exhibit areas. Requires a minimum of associate's degree in related field and two years' experience in animal behavior training. Strong communications and public presentation skills a must. Salary \$15,500-\$18,000 plus benefits. Submit resume to: Personnel, Philadelphia Zoo, 34th St. and Girard Ave., Philadelphia, PA 19104.

SUMMER EDUCATION INTERNSHIPS...available in the areas of art, science, and outdoor education. Instructors will work under the direction of the zoo education department staff in planning, conducting and evaluating zoo day camp sessions for age groups from pre-school through 5th grade. Two years of college work in elementary education or environmental interpretation or applicable experience preferred. Salary is \$150.00 per week for the 10-week internship beginning 22 June and ending 28 August 1987. Send resume and letter of intent to: Jay Jasan, Assistant Director of Education, Staten Island Zoo, 614 Broadway, Staten Island, NY 10310 by 15 April 1987.



AAZK MEMBERSHIP APPLICATION

Name _____ Check here if renewal []

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Work Area _____ Special Interests _____

Mail this application and check or money order (U.S. CURRENCY ONLY PLEASE), payable to American Association of Zoo Keepers, Inc., to: AAZK National Headquarters, Topeka Zoo, 635 Gage Blvd., Topeka, KS 66606.

Membership includes a subscription to *Animal Keepers' Forum*. The membership card is good for free admission to many zoos and aquariums in the U.S. and Canada.

INFORMATION FOR CONTRIBUTORS

Animal Keepers' Forum publishes original papers and news items of interest to the Animal Keeping profession. Non-members are welcome to submit articles for consideration.

Articles should be typed or hand-printed. All illustrations, graphs and tables should be clearly marked, in final form, and should fit in a page size no more than 6" x 10" (15cm x 25½cm). Literature used should be cited in the text and in final bibliography. Avoid footnotes. Include scientific names. Black and white photos only accepted.

Articles sent to *Animal Keepers' Forum* will be reviewed for publication. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Those longer than three pages may be separated into monthly installments at the discretion of the editorial staff. The editors reserve the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope.

Telephone contributions on late-breaking news or last-minute insertions are accepted. However, phone-in contributions of long articles will not be accepted. The phone number is (913) 272-5821)

DEADLINE FOR EACH EDITION IS THE 15TH OF THE PRECEDING MONTH

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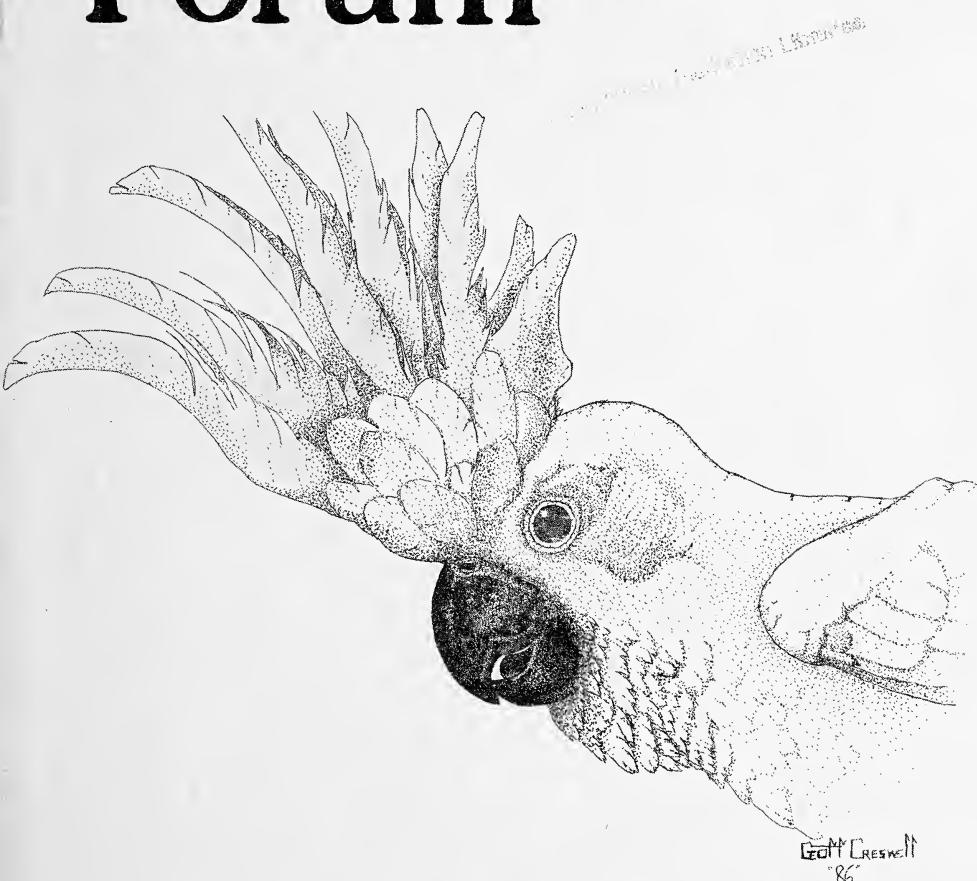
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MARCH 1987

Animal Keepers' Forum



Dedicated to Professional Animal Care

ANIMAL KEEPERS' FORUM, 635 Gage Blvd., Topeka, KS 66606.



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MARCH 1987
VOLUME FOURTEEN
NUMBER THREE

Animal Keepers' Forum (ISSN 0164-9531) is a monthly journal of the American Association of Zoo Keepers, Inc., 635 Gage Blvd., Topeka, KS 66606. Five dollars of each membership fee goes toward the annual publication costs of Animal Keepers' Forum. Second Class postage paid at Topeka, KS. Postmaster: Please send address changes to:

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This month's cover features the Sulphur Crested Cockatoo (*Cacatua galerita*), a member of the family Psittacidae native to New Guinea, Indonesia, Northern Australia, and now Oregon. This cover is a farewell dedication to Valkyrie Piper Kimball, former Veterinary Technician and AAZK Chapter President at the Topeka Zoo. Piper, her cockatoo and her cat are relocating to Wildlife Safari in Winston, OR where she will continue her career as a vet tech. Congratulations and best wishes from your family in Topeka. You will be missed. --- The Keepers, the AKF staff and the artist.

Scoops and Scuttlebutt

RESEARCH GRANTS AVAILABLE

The AAZK Research/Grants Committee announces the availability of grants for keeper-initiated research. Two awards of up to \$500.00 each will be awarded to full-time keepers who are members of AAZK. Proposals may be submitted at any time. For further information, contact Frank Kohn or Kaci Thompson, AAZK Research/Grants Committee, Department of Zoological Research, National Zoological Park, Washington, DC 20008.

REMINDER - ADT FORMS AVAILABLE TO ZOOS AND AQUARIUMS

Animal Data Transfer Forms for zoos and aquariums are available free of charge upon request. Contact Bernie Feldman, Burnet Park Zoo, 500 Burnet Park Drive, Syracuse, NY 13204.

PITTSBURGH ZOO MEMORABILIA SOUGHT

Very soon the Pittsburgh Zoo will be celebrating its 90th birthday. In honor of this occasion and the eventual centennial celebration, the Pittsburgh Chapter of AAZK would like to collect and display pieces of our Zoo's history. We are currently looking for any Pittsburgh Zoo (formerly called Highland Park Zoo) memorabilia. We could use anything at all that is reminiscent of our last 90 years including souvenirs, pictures, letters, patches, anecdotes and even helpful ideas. If you have something interesting that you don't want to part with, could you please send us a picture or a copy of it? Help us to make this project truly historic! Let me know if you can share a bit of the past with us. Contact: Kathy Robb-ibar or Regina Grebb, Pittsburgh Zoo, P.O. Box 5250, Pittsburgh, PA 15206 (412) 665-3632.

GORILLA BIBLIOGRAPHY AVAILABLE

The newly revised Second Edition of "A Gorilla Bibliography" is now available. It includes over 1200 listings, a subject index and references on behavior, disease, communication, nutrition, reproduction, conservation, ecology, hand-rearing, infant development, plus many more subjects. It is published by and directly available from the author, Mary D. Keiter. Prices, which include postage and handling are: Gorilla Bibliography 2nd Edition - \$25.00; Supplement #2 to 1st Edition [160 listings] - \$5.00. To order, send check or money order in U.S. Funds only to: Mary D. Keiter, 5635 40th Ave. West, Seattle, WA 98199, U.S.A. Include your complete name and mailing address.



Coming Events

AAZPA WESTERN REGIONAL CONFERENCE

April 5-7, 1987

Fresno, CA

For more information contact: Scott Ransom, Asst. Zoo Manager, Fresno Zoo, 894 Belmont Ave., Fresno, CA 93728 (209) 488-1549.

AAZPA CENTRAL REGIONAL CONFERENCE

April 12-14, 1987

Colorado Springs, CO

For more information contact: Gerald Brady, General Curator, Cheyenne Mountain Zoo, Box 158, Colorado Springs, CO 80901 (303) 633-0917.

AAZPA GREAT LAKES REGIONAL CONFERENCE

April 26-28, 1987

St. Louis, MO

For more information contact: William Boever, DVM, St. Louis Zoological Park, Forest Park, St. Louis, MO 63110 (314) 781-0900.

AAZPA SOUTHERN REGIONAL CONFERENCE

May 3-5, 1987

Tampa, FL

For more information contact: Judith Breuggeman, Education Coordinator, Busch Gardens, Box 9158, Tampa, FL 33674 (813) 988-5171.

AAZK 20TH ANNIVERSARY "FOUNDERS WEEKEND"

May 5-7, 1987

San Diego, CA

Held to honor the original founders of AAZK, the "weekend" will include workshops, tours, banquet, etc. For an information/registration packet contact AAZK Historian Art Goodrich, Mammal Dept., San Diego Zoo, Box 551, San Diego, CA 92112 OR see the February Forum for the gold insert which contains both registration form and hotel accommodations form.

BOTANICAL AND WILDLIFE ART SHOW

May 14-17, 1987

Los Angeles, CA

For more information contact: Patti Glover, Los Angeles Zoo, 5333 Zoo Dr., Los Angeles, CA 90027 (213) 664-1100)

THE 11TH INTERNATIONAL HERPETOLOGICAL SYMPOSIUM ON CAPTIVE PROPAGATION AND HUSBANDRY

June 17-12, 1987

Chicago, IL

For more information contact: Richard Hahn, Zoological Consortium, Inc., 13019 Catoctin Furnace Road, Thurmont, MD 21788 (310) 271-7488.

FIRST INTERNATIONAL CHILDREN'S ZOO SYMPOSIUM

July 1-4, 1987

Philadelphia, PA

For more information contact: Robert Callahan, Philadelphia Zoo, 34th St. & Girard Ave., Philadelphia, PA 19104 (215) 243-1100, Ext. 300.



Births & Hatchings

The Tulsa Zoo proudly announces the birth of 1.0 Asian elephant. This is a first for the Tulsa Zoo and the state of Oklahoma. The calf was born on 5 October 1986 at approximately 1:45 p.m. to our 20-year-old female and our 14-year-old male on breeding loan from the Memphis Zoo. The calf was pulled for a few hours after birth following attempts by both our females to kill it. The cows were separated and the calf reintroduced to his mother after a few hours. The calf is gaining weight well, his mother is gradually becoming more tolerant and mother and son remain physically (but not visually) separated from our other female and our male. Our elephant personnel have gone above and beyond the call of duty in performing their responsibilities as "aunties" and our Docents have been lifesavers by spending countless hours "Elephant Watching".

Our Reptile Department has also been kept busy with first reproductions at the Tulsa Zoo of 35 Fire-bellied toads and one Eastern box turtle. The toads have been in our collection since 1980 and the turtles since 1978. Our trio of Eastern box turtles have an outdoor pen and the single young was found walking around in the pen. Later the actual nest site was found with the single hatched egg in it. We also had our first reproduction of Eastern hognose snakes. Eight eggs were laid and all hatched in late October. It was too cool to release the young, so we are struggling to keep them fed until spring. Also, with the advent of 23 more Green Basilisks, our total reproduction of this species has reached 91 young. ---Janice Johnson Shores.

On 2 December, 1986, seven Bobobo arrived from Wassenaar Zoo, Wassenaar, Holland. The troop consists of two adult males, one juvenile male, three adult females and one juvenile female. They immediately went into quarantine until they will be unveiled to the public in early spring.

Femelle, our 24-year-old female gorilla, on breeding loan from the National Zoo in Washington D.C., delivered a stillborn male sometime between the night of 2 December and the morning of 3 December. The fetus appeared to be full-term, although we weren't expecting the birth until January 1987. The umbilical cord was wrapped around its neck. It was felt that death occurred within the womb rather than after birth.

Tanga, our 27-year-old male was allowed to remain with Femelle throughout the pregnancy and afterwards. After the birth, Femelle was allowed to keep the fetus until she willingly gave it up. Both adults displayed ideal parenting behavior until the fetus was removed six days later.

On 14 December, Saba, our 5-year-old Kudu, gave birth to twins! The young, a male and female, were born approximately two hours apart. The female weighed in at $33\frac{1}{2}$ lbs. at two hours of age. The male weighed in at $34\frac{1}{2}$ lbs. The entire family is doing fine. ---Carol J. Boyd

The new year at Burnet Park Zoo has started out to be very productive for the Small Mammal department. On New Year's Day, our first Blue Duiker (*Cephalophus monticola*) was born. The baby, a male, weighed 465 gms. (normal average is 600 gms according to Dr. Crown of Penn State). Our adult pair are on breeding loan to us from Penn State. We believe we are the only zoo in the Western Hemisphere to exhibit these blue duiker. In mid-January two Egyptian fruit bats were born and are beginning to become independent of their mothers. After two litters of Meerkats were cannibalized by the adults, we pulled the third litter for hand-rearing. We feel the adult females are under too much stress due to the exhibit design and this is currently being renovated. In addition, for an undetermined reason, two of the females are being bred simultaneously. At the end of

BIRTHS AND HATCHINGS, Continued

the month both of the species in our marsupial exhibit, Swamp wallabies and Sugar gliders, had offspring. The female Swamp wallaby's pouch exhibits a great deal of movement but only the joey's nose and forelimb have been seen during her cleaning of the pouch.

The Reptile and Amphibian department is attempting to display our animals in multi-species exhibits. We have been pleased with our results so far. In our South American frog exhibit the Green and black poison dart frogs reproduced. The tadpole metamorphosed to a frog in the exhibit on public display. This exhibit also contains Crested toads, Red-eyed tree frogs and Red and black poison dart frogs. Also, the Red-eyed tree frogs laid eggs and tadpoles hatched in the exhibit. These events took place within only two months of setting up the exhibit. ---Krista Larow

A Canadian first occurred at Metro Toronto Zoo on 20 December with the birth of a baby bongo. When keepers arrived at the exhibit, they were thrilled to see the newborn on its feet, completely cleaned off, and calmly nursing. The mother, 3-year-old Pamba, and the father, 4-year-old Gita, are on loan to Metro Toronto from the Los Angeles Zoo. Although this is Pamba's first birth, she is taking it in stride, and is mothering her baby like a veteran. The newborn was unsexed as of this report.
---Metro Toronto Zoo News Release

Winnipeg Conference Patches Available From National HQ

The 12th National AAZK Conference '86 patches featuring the polar bear logo are available from National Headquarters in Topeka. They are white imprint on navy background and measure 3-3/4" by 2-3/4". The cost is \$2.50 (US) per patch. To order, fill out and return the form below. Make check or money order payable to: "AAZK National".



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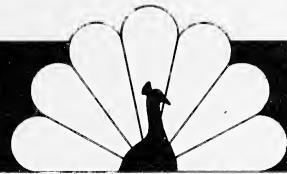
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Watch this space for what's new for zoos!

AAZK AWARD NOMINATIONS ARE NOW BEING ACCEPTED FOR 1987!

The AAZK Awards Committee would like to begin accepting nominations for the awards to be presented at the 1987 AAZK Conference in Milwaukee. In the January and February issues of AKF we covered information concerning the qualifications, nominations procedure, selection procedure, and an explanation of the AAZK EXCELLENCE IN ZOOKEEPING (EZ) and CERTIFICATE OF MERIT FOR ZOOKEEPER EDUCATION (CMZE) Awards. This month will focus on the MERITORIOUS ACHIEVEMENT AWARD (MA).

The deadline for all nominations is 1 JUNE 1987, so please keep this in mind when submitting your nominations. All awards given by AAZK do not have a minimum or maximum number offered each year, but if the nominees do not meet the qualifications and nominations procedure they will not receive the award for which they were nominated. Please submit all nominations to:

Rachel Rogers, Chairperson
AAZK Awards Committee
METROZOO
12400 SW 152 Street
Miami, FL 33177

AAZK MERITORIOUS ACHIEVEMENT AWARD

This award is given to professional members of AAZK or AAZK-affiliated chapters for outstanding achievement in the zoo or aquarium field and related activities. This award covers activities outside the scope of the Excellence in Zookeeping award. This would include such things as keeper participation in AAZPA Bean Award projects, individual breeding projects carried on outside of the zoo proper, wildlife conservation efforts, zoo and wildlife education programs, and other related activities.

Qualifications:

1. The nominee must be a full-time keeper, employed in any North American zoological institution or aquarium. In the case of an AAZK-affiliated chapter it must be "in good standing" and have an up-to-date charter with AAZK.
2. The nominee must have been employed at least one year on a permanent status at a zoo or aquarium. In the case of an AAZK-affiliated chapter it must have been on active status for at least one year.
3. The nominee must be nominated by his or her peers; while supporting nominations may be submitted by other zoo personnel. The nominators need not be from the same zoo or aquarium.

Nomination Procedure:

1. List name, position, institution, years of service in the field, and the recommendation of a peer or colleague.
2. List the outstanding achievements: AAZPA Bean Award project participation, exhibits, breeding, conservation, etc.

Selection Procedure:

The Awards Committee, consisting of five keepers, will independently review each nominee.



CAUZ SEEKS ZOO/UNIVERSITY LINK - Part 2

(Editor's note: In last month's AKF, an article on CAUZ from AAZK President Jean Hromadka was published. This initial article explained what CAUZ is and how it hopes to involve zoos and aquariums. This month, Part 2, continues with more information on CAUZ - specifically ideas which emerged from discussions of both the Education Group and the Research Group at their meeting held in August of 1985. The Consortium of Aquariums, Universities and Zoos (CAUZ) is headed by Dr. Donna FitzRoy Hardy, Ph. D., professor of psychology, California State University, Northridge, Northridge, CA 91330. More information about the organization may be requested by writing Dr. Hardy.)

Ideas That Were Shared in the Education Group included:

1. CAUZ education projects will include:
 - teacher training at all levels through workshops and extension courses.
 - on-going courses and seminars for zoo keepers
2. CAUZ will provide a library of zoo resource materials (movies, videotapes, classroom exercises that teachers have developed and made available.
3. CAUZ can serve as a network to help in setting up educational programs at zoos.
4. CAUZ can provide a list of zoo, aquarium and university people for students to consult for their projects as well as provide other resources to them.
5. CAUZ will act as a focus for gaining funding for collaborative projects for joint teacher training, etc.
6. CAUZ will serve to match university people to project sites in zoos and aquariums.
7. CAUZ will develop standardized protocols for zoo/aquarium people to use university resources and for university people to use the resources of the zoos and aquariums.
8. CAUZ can provide a "skills bank" listing of people and their expertise.
9. CAUZ can provide a list of grant sources [This has already been developed through the Sponsored Projects Information Network and other sources; contact D. Hardy.]
10. CAUZ can compile a catalog of all education programs now successfully in place as well as information on who to contact about these programs.
11. CAUZ can identify university programs suitable for use by qualified high school students.
12. CAUZ can act as a repository for information on visitor types and behavior and provide literature reviews on this subject.

Ideas That Were Shared in the Research Group included:

1. CAUZ can provide seminars for training in behavioral research for university professors so that they can understand the limitations imposed on the zoo on research as well as the standard research protocols. These faculty can be given the responsibility of supervising research projects conducted at the zoo by their students (after zoo approval).
2. CAUZ will collect the syllabi used at the various zoos (San Diego, Los Angeles, Washington Park Zoo and others) for the courses that they give in zoo research so that they can develop a standardized research course syllabus (and material), research methods and protocols, competencies needed by researchers to do behavioral research at the zoo and a list of limitations on zoo research.

CAUZ SEEKS ZOO/UNIVERSITY LINK - Part 2, Continued

3. If CAUZ develops a long-term research project, individual efforts can be coordinated and data pooled. [This would be patterned on the joint research project at the San Diego and Los Angeles Zoos on the California Condor conducted by Drs. Donald Lindberg and Cathy Cox].
4. CAUZ can provide an "information registry on zoo projects around the country which can provide a network between researchers from diverse fields (comparative psychology, anthropology, zoology, natural resources/conservation etc.)
5. CAUZ projects can be presented at Biology and Psychology and Anthropology Colloquia which are regularly scheduled on university campuses and special seminars can be given at various campuses throughout the year. A Speakers Bureau of zoo and aquarium people can be provided to campuses and various other groups.

(Editor's note: In reference to #1 under Ideas from Research Group: there has been some concern expressed about the manipulation of animals involved in research projects. AAZK does not endorse the undue manipulation of animals strictly for research purposes, however, it will be up to those individual zoos which choose to become involved in a CAUZ-connected research project to set their own limitations on animal manipulation and other research protocols.)



CONDOR UPDATE - USFWS Purchases Land for Condor Refuge

After several months of intense negotiations, the USFWS has purchased 11,000 acres of land as part of its efforts to save the endangered California condor. The parcel, known locally as the Hudson Ranch, is located in the uplands of southern California and will comprise the major portion of the Bitter Creek National Wildlife Refuge.

Negotiations culminating in the addition of the ranch to the Bitter Creek refuge spanned several years and involved numerous offers and counter-offers. In the end, the approximately \$3.9 million paid by the government for the Hudson Ranch and a smaller 1,300-acre parcel was less than half of the \$8.9 million made available by Congress for acquisition efforts on behalf of the condor.

Biologists working on recovery efforts for the condor rate the Hudson Ranch as the most important area of habitat within the bird's present range. In 1950, as many as 50 birds were spotted in the area. As recently as 1982, a total of 14 birds were observed. Service biologists are using the ranch as a base of operation for an effort aimed at capturing the last two condors - both males - remaining in the wild. The decision to trap these birds was made after wild condors suffered an unacceptably high mortality rate over the last few years. The two birds will become part of a breeding program underway at the San Diego and Los Angeles zoos where 24 other condors are already in captivity.

The Bitter Creek location will play a key role as a release site for future captive-bred generations of condors and will be managed to enhance the habitat for these releases. The first releases are expected sometime between 1990 and 1992, depending on the success of the captive breeding effort.

The original proposal to acquire the ranch dates back to 1982. The Audubon Society and several other conservation groups supported the acquisition and Congress first appropriated funding for the acquisition in 1984.



DEVELOPING ZOOS

By

Jim Ellis, Graduate Student
Museum Studies and Conservation Program
Florida State Museum
University of Florida, Gainesville, FL

In the summer of 1985 I spent four months working with colleagues and collecting data on the history and status of captive management of Brazilian wildlife in local zoos. From this experience it would appear at first glance to be a simple project to develop an article on the status of zoo-keeping in what we call today "developing" countries; countries because my original and continuing interest is the status of zoos in Latin America. In fact having been raised in Argentina led to my first zoo experience which was as a visitor to the Buenos Aires zoo, the oldest zoo in South America having been built in 1864 and moved to its current site in 1888 (Table I).

Following over fourteen years of working in various U.S. zoological parks and a return to university life, I was given the opportunity to participate in an exchange program that exists between the University of Florida's Amazon Research Training Program and the Museu Paraense Emilio Goeldi, Belem, Brazil. The primary objective of this relationship between the University and the Museu is to provide a mutually beneficial channel whereby the University has access to research facilities in Amazonia and the Museu receives highly valued consulting assistance in the operations of their facilities. In my case there existed an option for the University to interact in zoo management as the Museu was in the process of redeveloping their zoological and botanical park built in 1899. This led to my working at the Museu for two and a half months out of the total of four months spent in Brazil. All of these experiences I had hoped would provide me with a better understanding of the process of zoo development yet instead of simplification, my perspective has become one of even greater complexity.

The ever-increasing sophistication in the nature of zoos in the United States creates an unfortunate bias in the traveling public, and perhaps as well in the professional, towards those facilities in other parts of the world if not at times in parts of the U.S. Our ever-increasing knowledge and ability to take species with virtually no chance of natural survival in the wild and reproduce them to the point where we have to artificially control their numbers is perhaps a great luxury and asset. Our lack of knowledge and understanding of the situation in developing nations is perhaps one of our poorest areas of awareness as well as involvement. Having overgeneralized somewhat I am forced in this preliminary description of my experiences to continue to generalize somewhat for to specifically describe actual situations may in fact lead to further stereotyping or characterizing that would continue to promulgate unfortunate myths. Prime examples are that there is no interest by South American facilities in contact with foreign facilities; that there is no technological sophistication within these facilities; and that the only language in South America in Spanish when in Brazil Portuguese is the spoken language.

Evolution is defined by Webster as "a process of continuous changes from a lower, simpler, or worse to a higher, more complex or better state". This best describes what I professionally feel is the overall situation within South America and Brazil in particular. There are within Brazil over 40 zoological parks (see Table I for a preliminary listing based on IZY survey of zoos of the world) that vary from those that are municipally

DEVELOPING ZOOS, Continued

state, federally and privately owned. The majority however are operated by state governments. At least two facilities that I am aware of are run by state universities, one by a major, internationally funded iron ore mining project (Carajas, Para); two that are federally owned, and so on. Species exhibited range from totally native species to those zoos that have historically exhibited mixed collections. There appears to have been a gradual decline of non-native species entering the country which is linked in all probability to the country's 200% inflation rate which as of this year has been "stopped" with major price and wage freezes. Additionally, the establishment of international trade restrictions has had its effect on the potential resource base that their native wildlife provided in the past. This is not intended to sanction that trade; however it must be acknowledged that the demand by international facilities in the past did provide a major resource which allowed many of those facilities located in the more affluent southern regions of the country to expand on their collections of non-native species and attempt to take their place in today's stereotyped image of what a zoo is.

Current collections are growing in their exhibition and management of native species both due to the lack of other resources and availability of native wildlife, international pressure by conservation agencies, and pressure from Brazilian citizens who are concerned with the well being of Brazil's vast forest and wildlife resources. Another factor which has not been widely discussed is that of the pressure displaced wildlife is placing on the system of zoos and wildlife management agencies within the country. Many facilities especially in the economically poorer yet wildlife rich areas have not had a need for many years to be concerned with the purchase of specimens. Obviously today, purchase or trade in general of any native species is banned by Brazilian laws unless its source is captive-bred stock; however even if these restrictions did not exist the flow of specimens into what here we would call wildlife rehabilitation programs would probably be very high.

Today's Brazilian zoological parks may see approximately 400 specimens per year with some regional variations based on the nearness to "undisturbed" forest or wilderness areas. One zoo received seven jaguar kittens on one day, others receive up to one per month; another zoo received three giant river otter pups dug from their nest by well intentioned people who thought them abandoned; other zoos receive sloths on the average of one per week; and surpluses of donated cebus monkeys may range into numbers above 50 at some facilities (remember these are not captive-born specimens). Of course this is just for mammals; birds and reptiles account for even high numbers in some instances. One facility in particular is trying to deal with an excess of donated and confiscated *Podocnemys expansa* of over 100, most of which are adult specimens, and *G. carbonaria* numbering in the 80's. Young psittacines that are confiscated or brought in may range in numbers up to 50 individuals at a time, and most of which are young enough that they should be hand-reared. Of course mortality will take its toll, the hardy will survive and the statistics will be skewed in favor of high mortality and low births. Conservation will suffer and this excess of inflow may further hinder the facility's ability to develop in a normal fashion. Finances suffer, collections suffer, public relations has nightmares, and most importantly, professionals cannot do more than just keep up with the tide or simply try to do their best.

At the level of the zookeeper we have no really comparable situation here in the U.S. today. Perhaps if you can remember the following you can relate. As a zoo manager your first goal will be to hire someone who will do a full day's work for minimum wages which in 1985 was the equivalent of

DEVELOPING ZOOS, Continued

U.S. \$30.00 a month and today is the equivalent to U.S. \$50.00 a month. This person is almost guaranteed to be male and supporting a family of two to three individuals. Comparing this earning power to the cost of food to meet the minimal daily requirements for a family of three which is about two and a half times the minimum wage leads one to understand why keepers often work seven days a week and often at two jobs. Secondly, if you are interested in collecting any data on your specimens or interested in the well being of your staff, you may have to teach them to read and write which often then qualifies them for better work in other job situations.

Once on the job, the keeper will be working in conditions that may vary from those where the modern conveniences of having adequate equipment such as just rakes and shovels to boots and raincoats cannot be afforded or where the daily dietary needs of the animals are being met with contributions from local grocers, health department confiscations of food and those of fishermen as well as with the meager finances that are prioritized for the animals. Finally, if you are a well-trained keeper, you may find that there is a complete lack of current information (even old) resources and that you are "flying by the seat of your pants". Again, these generalities are dangerous because there do exist facilities that grow over 60% of their vegetable and fruit needs, that have access to the local farm trade commercial feeds (but not exotic feeds such as we are accustomed to), and that have access to fully equipped kitchens that cook daily rations for the animals based on sophisticated in-house diets. One zoo has a fully equipped modern library building recently opened, and many others have fully equipped veterinary treatment areas. The full range of variety exists as well with access to equipment for construction; in fact, one facility even can produce its own chain link and mills its own wood. Actually in many facilities the conditions provided the animals are better than the living conditions of the keepers who care for them and the public who lives in the region around the facility.

Following all this one is still left in a quandry of how to appropriately describe the situation and the status of zoos on Brazil and in developing countries. Perhaps the best we can do is to become involved and offer our resources in an effort to expand our ability to impact our fellow man and fellow animals. Emphasis in our own in-house and outreach education programs needs to focus on the on-going impact we as developed nations are having on the last of our resource-rich neighbors and, more importantly, on the outcome of that impact. The zoos of Brazil and of South America as a whole are definitely interested in contacts with their U.S. and other foreign counterparts. Areas of exchange that would help today are as simple as establishing a system for providing newsletters, literature references, copies of educational programs and related materials as well as current affairs information on husbandry techniques and veterinary care. Every facility that I visited welcomed me with open and friendly arms and provided me with every scrap of information that is currently available on their facilities. In fact their AAZPA counterpart or our sister professional organization, the Sociedade de Zoologicos do Brazil (SZB), although still in their infancy (7 yrs) and growing is annually surveying their members' collections of mammals and birds as well as holding annual meetings of their membership. Ample opportunities do exist for positive interactions and the development of future professional relationships.

Anyone interested in specific information should feel free to contact me at: 4017 NW 33rd Ave., Gainesville, FL 32606. Special acknowledgement is

DEVELOPING ZOOS, Continued

due for the continued support of the Amazon Research Training Program; Wildlife Preservation Trust, Inc.; Dr. Faical Simon, Sao Paulo Zoo; Dr. Lazaro Puglia, Parque Zoologico "Quinzinho Barros"; Dr. Claudio Giacomini, Parque Zoo-Botanico do Rio Grande do Sul; Antonio Carlos Lobo Soares, Parque Zoobotanico do Museu Goeldi; and Dr. Guiherme De La Penha, also of Museu Goeldi; and many others in Brazil who helped and continued to support my work.

TABLE I South American Zoological Parks and Aquaria

The following is a listing of the names of South American Zoological Parks and Aquaria that have been collected from the International Zoo Yearbook since its inception. The facilities are identified as to country, name of facility, city found in, and where possible year opened and management authority. For Brazil there is a large number of facilities not listed here which never have appeared on the IZY survey of zoos of the world; information on these will be published at a later date.

ARGENTINA

1. Jardin Zoologico de Bahia Blanca, Bahia Blanca
opened: 1966
2. Acuario, Museu de Ciencias Nat. Buenos Aires
opened: ?
3. (*) Jardim Zoologico de Buenos Aires, Buenos Aires
opened: 1864, moved to current site 1888
Municipal zoo
4. (*) Jardim Zoologico La Plata
opened: ?
Province supported zoo
5. Jardin Zoologico de Mendoza Mendoza
opened: ?
State supported zoo
6. Acuario Municipal Mendoza
opened: 1945
7. Jardin Zoologico Municipal Rosario
opened: ?
8. Estacion Hidrobiologica Rosario
also listed as the Acuario del Centro de Investigaciones
National support

BOLIVIA

9. Zoologico Municipal Cochabamba
opened: ?
10. Jardim Zoologico Oruro
opened: ?
11. Parques y Paseos La Paz
opened: ?
(Municipality)
12. (*) Zoo Santa Cruz Santa Cruz
opened: 1979
Municipal zoo

DEVELOPING ZOOS, Continued

BRAZIL

13. (*) Parque Zoologico Municipal, Aracatuba, S.P.
opened: ?
14. (*) Jardim Zoologico de Belo Horizonte, Belo Horizonte
opened: ?
Municipal zoo
15. (*) Jardim Zoologico Brazilia, D.F.
opened: 1960
Federal zoo
16. (*) Parque Zoologico Municipal Curitiba, S.P.
opened: ?
17. (*) Parque Zoologico Municipal Goiania, Goias
opened: ?
18. (*) Parque Zoologico e Safari Gracatai, R.S.
opened: ?
19. (*) Parque Zoologico de Londrina, Londrina, Pr.
opened: 1973
Private zoo (listed as being closed to the public)
20. Parque de Primates Manaus, Amazonas
opened: ?
University facility
21. Parque Zoologico Municipal Manaus, Amazonas
opened: 1938, Closed, 1984
Municipal zoo
22. (**) I.N.P.A. Manaus, Amazonas
opened: ?
Federal facility
23. (*) Parque Zoologico Municipal Maringa, Parana
opened: ?
24. (*) Jardim Zoologico Museu Paraense Emilio Goeldi, Belem, PA.
opened: 1899 (Museum opened 1869)
was State operated than transferred to Federal
operations where it remains to this day
25. (*) Parque Zoologico Municipal Ondina, Bahia
opened: 1956
State zoo
26. (*) Parque Zoologico Municipal Osasco, S.P.
opened: ?
27. (*) Parque Zoologico Municipapl Piracicaba, S.P.
opened: ?
28. (*) Parque Zoologico de Pomerode, Pomerode, S.C.
opened: ?
Private zoo
29. (*) Parque Zoologico Municipapl Riberao Preto, S.P.
opened: ?
30. (**) Jardim Zoologico Porto Alegre, R.S.
opened: ?
31. (*) Jardim Zoo-Botanico do Doris Irmaos, Recife, P.E.
opened: 1916
was under the State Agricultural Affairs department
recently transferred to the State Tourism Board control
32. (*) Jardim Zoologico Rio de Janeiro, R.J.
opened: founded-1913, opened-1945
State governed, turned over to a foundation in
1985
33. (**) Parque Zoologico do Rio Grande do Sul, Sao Leopoldo, R.S.
opened: ?
State governed, turned over to a foundation in
1974

DEVELOPING ZOOS, Continued

34. (*) Fundacao Parque Zoologico de S.P., Sao Paulo, S.P.
opened: 1958
State supported, came under foundation operation
in 1959.

35. (*) Parque Simba Safari Sao Paulo
opened: ?

36. (*) Parque Zoologico Sorocaba, S.P.
opened: 1968
Municipal zoo

37. (*) Parque Zoologico Teresina, Piau
opened: 1973/State zoo

38. (*) Parque Botanico e Zoologico, Varginha, M.G.
opened: ?

39. Museo Mello Victoria, E.S.
opened: ?
Private facility

CHILE

40. Jardin Zoologico de Chillan Chillan Viejo
opened: 1959
Privately founded but supported by society, city
and state funds

41. Jardim Zoologico Concepcion
opened: ?

42. Acuario Concepcion
opened: ?
(probably University operated)

43. Jardim Zoologico Nacional Santiago de Chile
opened: 1924 or 1925
Federal facility

44. Jardin Zoologico Valvidia
opened: ?

45. Jardin Zoologico Escuela Normal
opened: ?

COLUMBIA

46. Zoological Garden Cali
opened: ?

47. Jardim Zoologico Bogota
opened: ?

48. Jardin Zoologico de Sociedad de Mejoras Publicas, Barranquilla
opened: 1965
Supported by Sociedad de Mejoras Publicas

49. (*) Parque Zoologico Santa Fe Medellin
opened: ?

50. Zoologico de Matecana Pereira
opened: ?

ECUADOR

51. Zoological Garden Eloy Alfaro Quito
opened: ?

GUYANA (formerly BRITISH GUIANA)

52. Guyana Zoological Park Georgetown
opened: 1947, formerly known as British Guiana Zoo
Federal zoo

DEVELOPING ZOOS, Continued

PARAGUAY

53. Jardin Zoologico de la Santisima Asuncion
opened: ?
Municipal zoo

PERU

54. Jardim Zoologico Lima
opened: ?

55. Parque Zoologico de la Universidad Cuzco
opened: ?/ University zoo

56. (*) Parque Las Leyendas Lima
opened: under construction 1966, open-1968
Federal zoo

URUGUAY

57. Jardim Zoologico Municipapl Montevideo
opened: ?
Municipal zoo

58. Jardin Zoologico de Durazno Durazno
opened: ?
Municipal zoo

59. Parques Zoologico Municipapl Salto
opened: ?

VENEZUELA

60. Parque Zoologico Bararida Barquisimeto
opened: ?
State zoo

61. Parque Caricuao Caracas
opened: under construction-1976, open-1977
Federal zoo

62. Jardim Zoologico "El Pinar" Caracas
opened: ?
State zoo

63. Parque del Este Caracas
opened: under construction-1966, 1972 first data
available/Federal zoo

64. Jardin Zoologico Maracaibo Maracaibo
opened: 1973

65. Parque Sur Maracaibo Maracaibo
opened: under construction-1976, no data follow-
ing 1976/Federally supported

66. Jardin Zoologico "Las Delicias" Maracay
opened: ?
State zoo

67. Jardin Zoologico Chorros de Milla Merida
opened: ?

68. Aquarium Augustin Codazzi Miranda
opened: ?

69. Acuarium de Valencia Valencia
opened: ?
Private aquarium

DEVELOPING ZOOS, Continued

Remarks:

opened: ? - indicates an absence of information on when the facility was first developed.

(*) These facilities are known to be in actual existence based on personal knowledge of the facility, communication with the facility or through communication from others.

(**) I.N.P.A. is the Brazilian National Amazonian Research Institute (Instituto Nacional de Pesquisas Amazonicas) and they did have a small animal holding facility that was open to visitors. Same site where Robin Best holds many of his manatees (Trichecus inunquis). The animal holding areas were basically closed in 1985.

(***) The actual zoological park for the region is the one in Sapucaia do Sul with a mailing address of Sao Leopoldo. The city of Porto Alegre has a well kept mini-zoo in a downtown park which is probably the zoo referenced as being in Porto Alegre. Extreme confusion may arise because even today those that refer to the zoo in Porto Alegre usually are speaking about the one in Sapucaia do Sul (Sao Leopoldo).



Information Please

Felid Research and Conservation Interest Group - I would like to organize an interest group whose purpose would be to share information from conferences, symposia, and ongoing research among all individuals interested in felid research and conservation. Additional activities could be the generation of a felid and felid-related bibliography, a periodic literature update, the generation of a quarterly newsletter, and a directory of interested individuals. If you have a sincere interest in participating in such a group, please send a self-addressed, stamped envelope to: Gail E. Foreman, Dept. of Zoology, OSU, 1735 Neil Ave., Columbus, OH 43210.

I am interested in gathering information on the hand-rearing of psittacine chicks. Specifically, I would like to know what type of enclosure the chicks are kept in (incubator, cardboard box with heating pad, etc.), and what type of materials are best for cleanliness, absorbancy and comfort to the chicks. Also, at what age are the chicks fully weaned? Please send all replies to: Marcelle Guidry, Greater Baton Rouge Zoo, P.O. Box 60, Baker, LA 70704-0060. Phone (504) 388-9392 (night).

I would like personal comments and information related to asphalt yards for hoofstock and farm exhibits. Responses on health problems and benefits, husbandry, esthetic values, education and visitor enjoyment, will be greatly appreciated. Send to: Kit Niemann, P.O. Box 116, Olalla, WA 98359.



THINK Safety!

FOOD PREPARATION/STORAGE HAZARDS EXAMINED

By

Marsha Ciborek
THINK Safety! Coordinator
Akron Zoological Park, Akron, OH

On 12 and 13 December, I attended the Sixth Annual Dr. Scholl Conference on the Nutrition of Captive Wild Animals, held at Lincoln Park Zoological Gardens. This conference focused on the keeper's role in zoo nutrition. While all the presentations were extremely informative for those attending, I found two to be highly pertinent to animal and keeper safety.

"Hazards Associated With Food Preparation and Storage," presented by Laura Jane Stuart, suggested that animals do suffer from food poisoning caused by food infections and food intoxications. Food infections are caused by the ingestion of bacteria such as Salmonella, Shigella, E. coli, Streptococcus, B. cereus, and Campylobacter jejuni. Symptoms may include nausea, diarrhea, vomiting and low grade fever. Some of these bacteria can be transmitted from man to animals, and back again to man. Food intoxications are caused by the ingestion of toxins produced by bacteria, molds, plants and insects. While food intoxications are less frequent than food infections, the results can often be fatal. Food intoxications are caused by the toxins produced by Clostridium botulinum, Staphylococcus aureus and Clostridium perfringens. Symptoms range from severe gastroenteritis, to paralysis and death. Ms. Stuart stated that food infections and intoxications can be prevented by promoting proper food storage, such as the quick refrigeration of cooked foods with as little handling as possible. Also, mice, roaches, ants, etc. should be eliminated from commissaries and other food prep areas. Food should be kept in containers with lids, and meats should be kept at 40°F. Thawing of meats should occur under refrigeration.

Robert Aherin spoke on the "Human Health Hazards Associated With Feed Handling." The breathing of feed dust and plant material which is moldy can cause problems for keepers who regularly work with hay, silage, and grain. The breathing of feed dust can lead to the development of scar tissue in the lungs and to bronchitis. More problems in molding of hay occur than in molding of grain. Bacteria and fungi produce toxins which can cause the problems discussed previously. The breathing in of moldy plant material can cause "farmer's lung" and "grain fever" or "toxin organic dust syndrome." Farmer's lung is an allergic reaction to bacteria in the body. The reaction may become more severe with repeated exposures. This may cause lung damage with restricted breathing. Grain fever occurs one or two days after exposure to moldy grain, and causes irritation of the lung linings. Mr. Aherin encourages respiratory protection through the use of a dust respirator, which blocks fine dust from entering the lungs.

AAZK Chapters: Keep watching for the opportunity to be project head for an exciting THINK Safety! key chain being designed by Eric Krussman from Wilmington, DE. Details in a later issue.

Any animal or keeper safety information or ideas can be sent to me, Marsha Ciborek, at the Akron Zoological Park, 500 Edgewood Ave., Akron, OH 44307.



Zooquest® Order Form

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Address _____

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quantity

U.S. residents, please include \$4.00 U.S. shipping & handling. Please allow 4-6 weeks
Canadian residents, please include \$2.50 Canadian shipping & handling. for delivery.



DARRY
WIEBE

CONFERENCE '87

MILWAUKEE, WI

October 4-8, 1987



Conference Photo Album

Remember Winnipeg, or Miami, or Seattle, or...Oh, go get your photo album, I'll wait.

"There's Joe in front of the lion exhibit. And the Philly gang at the icebreaker. Jackie sure gave a good presentation, wouldn't have guessed she was scared. Here's one from the post-conference trip to Churchill.. I was impressed!"

Share those memories.

The 1986 National AAZK conference in Winnipeg saw the introduction of the Conference Photo Album. A collection of photographs from previous national and regional conferences, submitted by attendees from all over North America, the Album will travel from conference to conference.

These photographs are people-oriented and include shots of the icebreakers, zoo tours, hospitality room or banquets, among others.

Please make a note to submit your photos along with your registration. Photos will not be returned. 3½" x 5" preferred. Send photos to: Conference '87 Photos, Milwaukee County Zoo, 10001 W. Bluemound Road., Milwaukee, WI 53226.

Help keep the conference alive with pictures.

Crossword Clues For March

Hope you photocopied your crossword puzzle out of last month's AKF so you're ready to fill in this month's blanks. Here are the clues for March. Remember you can win extra chances to be awarded two nights free lodging at the conference site, Sheraton Mayfair, by completing the puzzle correctly. Here goes...

ACROSS:

13. Conference '87 city.

DOWN:

14. 1986 National conference city.

21. Snapshots must be brought for the conference _____ album.

22. Animal used on the AAZK-Milwaukee Chapter logo.

1987 AAZK NATIONAL CONFERENCE REGISTRATION FORM

October 4-8, 1987 - Milwaukee, WI

Please type or print. (One name per form)

Name _____

Address _____

City _____ State/Prov. _____

Zip Code _____ Telephone # (____) _____

Zoo Affiliation _____

Area of Interest _____

AAZK Committee Member? _____

Will be submitting a paper: Yes No
(\$20.00 will be refunded from registration fee on acceptance of paper)

Participating in Zoolympics: Yes No

Bringing an auction item: Yes No Describe briefly _____

Vegetarian: Yes No (Specify type _____)

Banquet Entree: (check one) Beef Chicken Vegetarian

Are you interested in a Conference T-Shirt: Yes No (S M L XL)

AAZK Membership Status and Fees:

Member/Spouse	\$55.00	each
Non-member	\$70.00	each
Late Fee	\$10.00 (After August 15, 1987)	

Total Fees Enclosed \$ _____

One-Day rates for individual conference events are available. Contact Steven M. Wing for details.

Arrival date and time _____
Let us know ASAP if you need pick-up assistance.

Please make payment to: AAZK-Milwaukee Chapter.

Return this form with your fee to: Conference '87, Milwaukee County Zoo, 10001 W. Bluemound Road, Milwaukee, WI 53226.

HOTEL RESERVATION REQUEST

1987 AAZK National Conference
October 4-8, 1987



Name _____

Address _____

City _____

State/Prov. _____

Zip Code _____ Telephone # (_____) _____

Date of Arrival _____

Date of Departure _____

Guaranteed by: Credit Card _____ Check _____

Credit Card _____

Card # _____

Expiration Date _____

Rooms will be held only until 6:00 p.m. unless guaranteed by either credit card or one night's deposit.

	<u>Db1./Db1.</u>	<u>King</u>
1 Person _____	_____ \$50.00	_____ \$50.00
2 Persons _____	_____ \$50.00	_____ \$50.00

I will be sharing a room with _____

We will be able to match-up single delegates with roommates.

Do you need a roommate: Yes _____ NO _____

If Yes, state restrictions (i.e. male/female, nonsmoker, etc.) _____

We will make every effort to match roommates, but we cannot guarantee it.

Return this form to:

Conference '87
Milwaukee County Zoo
10001 W. Bluemound Road
Milwaukee, WI 53226

Pre-Conference Tour

Sunday, 4 October, will be the date for the pre-conference tour to Henry Vilas Zoo, Madison, and the International Crane Foundation, Baraboo, WI. Bus transportation and lunch will be provided for a small fee. Watch for details in the Forum.

Post-Conference Tour

Announcing the 1987 AAZK National Post-Conference Tour to Chicago, IL - home to the Brookfield and Lincoln Park Zoos and the Shedd Aquarium. The tour will be a two-day trip and will include all three institutions.

Busses will depart Milwaukee on Friday, 9 October and return Saturday, 10 October. Overnight lodging will be included in the fee. Details will be forthcoming in a future issue of the Forum.



THE CHALLENGE IS STILL ALIVE

ZOOQUEST®

The maintenance of wild animals in captivity or zookeeping is a profession based on knowledge, experience and common sense. It requires patience, dedication and a love and respect for the wildlife of the world.

ZOOQUEST takes place in a zoo; each player is a zookeeper. It is a game of adventure, knowledge, and chance. A number of aspects of game-playing are involved - strategy, intellect and luck. As well, a unique feature of **ZOOQUEST** is its function as a learning resource. Questions and answers about many of the world's animals provides the player an opportunity to learn about wildlife and stimulates one's interest and concern for animal life in general.

The playing board is a map of a zoo divided into four geographical areas: **The Americas**, the **African Range**, the **Eurasian Pavilion**, and the **Australasian Exhibit**. Each zoo area has seven threatened or endangered animals representing wildlife of that part of the world. The object of **ZOOQUEST** is to collect six of the endangered animals. As the player progresses through the various zoo areas with the use of a die, zookeeping tools such as shovels, rakes and capture nets may be collected and used, animal-related situations or scenarios challenge the player to use strategy or make choices, and animal knowledge may be required or helpful.

Endorsed by the American Association of Zookeepers.



A Preliminary Analysis of Space Use, Body Orientation and Tail Use in Captive Ringtail Possums (*Pseudocheirus peregrinus*)

By

Frank B. Kohn

Dept. of Zoological Research

National Zoological Park, Washington, D.C.

Historically, marsupials have been rarely displayed in zoos. Although the larger macropods are popular among the public, their frequency of display may be attributed to their diurnal activity and social habits and thus the ease with which zoos can exhibit them. The vast majority of marsupials however, have been ignored for exhibition because a large percentage of them are small, nocturnal and solitary and therefore less visible and less popular with the viewing public. The difficulty in designing an active, dynamic exhibit popular with the public could be a primary reason many zoos balk at exhibiting the lesser known marsupials. In addition, the lack of many nocturnal displays could reflect the reluctance of zoos to display nocturnal mammals. In Australia much research on marsupials in the field and in captivity is shared and facilitates their exhibition in Australian zoos (Evans, 1979), but North American Zoos lag behind in the display of animals relatively unknown yet fascinating to the public.

The ringtail possum *Pseudocheirus peregrinus*, is an arboreal marsupial common throughout all of eastern Australia, Tasmania and Southwestern Australia in forest and urban areas (Tate, 1945; Thomson & Owen, 1964; Smith & Hume, 1984). They are like many small marsupials, nocturnal and solitary. Their population biology and food habits have been documented (Presidente, 1979), but many aspects of their behavior have not been described in detail.

The National Zoological Park first obtained 2.2 *Pseudocheirus peregrinus* from the wild in 1982 and currently houses twenty-three ringtail possums as part of studies on its management and husbandry, reproductive energetics and life history. Our breeding success has suggested their adaptability to captivity and therefore their potential for zoo exhibition.

Knowing how hard it is to successfully exhibit small groups of nocturnal mammals, I decided to observe ringtail possums to learn about and quantify their activity and habitat use. By doing this under off-display conditions, I could collect information which might facilitate construction of an exhibit that would maximize activity and therefore visibility. I hoped that this project would prove informative to zoos interested in expanding their collection and acquiring ringtail possums as an active exhibit animal and part of a nocturnal, small mammal display.

The purpose of this study was to conduct a preliminary analysis of the ringtail possum's use of space and substrates, identify areas of focal attention and activity,

CAPTIVE RINGTAIL POSSUM STUDY, Continued

and to provide information relevant to exhibit design. Data were also collected on activity periods, body orientation and the use of the prehensile tail. The results provide preliminary data on substrate use and an understanding of the species's environmental requirements.

METHODS

Four animals (3.1) ranging from one to three years old were used as subjects (Table 1). Two of the males were father and son and were housed together. The female observed was housed with two offspring, however these two young animals were not included in this study. The third male was housed with a sibling who was not observed. These animals were housed in wire mesh cages supported by wooden framework measuring 6 1/2 feet high x 12 feet long by 5 1/2 feet wide. Each animal had access to a nest box measuring 12" x 7" x 7" partially filled with soft paper strips and burlap for nesting material. One box was provided for every two animals. The cages were located at the National Zoological Park's Department of Zoological Research, an area not open to the public.

Table 1 ANIMALS OBSERVED

F#2 Wild Caught	Approx. 4 yrs.	In Cage with 1.1 offspring
M#5 Wild Caught	Approx. 4 yrs.	In Cage with Mate & 2.0 offspring
M#6 Captive Bred	Born 8-30-84	Son of M#5
M#7 Captive Bred	Born 8-5-84	In cage with Male littermate

The animals were maintained on a 12:12 day:night photoperiod. Night was illuminated by 60 watt blue light bulbs situated at twenty-five foot intervals along the ceiling in the holding cage room. During the diurnal period 60 watt floourescent bulbs provided bright white illumination. The white and blue lights were programmed to turn on an off in a staggered pattern to simulate dawn and dusk.

The animals were weighed weekly to monitor growth and condition. Cages and nestboxes were cleaned at weekly weighing. The diet (Table 2) consisted of assorted vegetables, fruits, grains, and several other supplements. Animals were fed immediately prior to 1500 hours since Pseudocheirus is primarily nocturnal and usually did not begin feeding until the dark phase of the light cycle.

Each cage was provided with a variety of substrates (for purposes of this study a substrate is defined as the type of surface on which an animal is positioned) (Table 3) including tree branches, 2" x 2" wood beams, 1" diameter dowels, 2" and 1" bamboo poles, planks, and feeding platforms (one or two per cage). The different substrates were randomly situated throughout each cage to provide access to all areas of it.

CAPTIVE RINGTAIL POSSUM STUDY, Continued

Table 2 Diet of Ring-tailed possums
at National Zoological Park

6 - 1" square pieces of:

Carrots
Sweet potato
Apple
String beans
Bananas
Celery

4 - 1" square pieces marmoset diet

10 mealworms
6 Raisins
3 grapes
1 monkey chow biscuit
1/4 cup sunflower seed/peanut mix
1 tsp. cottage cheese
1 large leaf kale shredded

Table 3 Checksheet information of data
collected for ringtail possum space
use study

QUAD=CAGE ZONE 1-4 OR 1-6

HEIGHT=1-6 FEET

SUBSTRATE=TYPE OF BRANCH

2 = 2x2

P = PLANK

FP = FEEDING PLATFORM

T = TREE

D = DOWEL

NB = NEST BOX

B = BAMBOO

F = FLOOR

M = MESH

ANGLE 0° = PARALLEL WITH FLOOR

30°, 45°, 60°, 90°

(+) = HEAD UP, (-) = HEAD DOWN

POSTURE

BRANCH

T = PERPENDICULAR TO BRANCH

= = PARALLEL TO BRANCH

TAIL USE

G = GRASPING

D = DRAPED

R = RESTING

H = HANGING

S = STRAIGHT OUT

*

CAPTIVE RINGTAIL POSSUM STUDY, Continued

Data on positional behavior were collected through visual observations between 1500 and 1800 over fourteen non-consecutive nights. One minute scan sampling was conducted on a single focal animal. One animal was observed per evening for one to two hours. Almost 20 hours (1188 minutes) of observation were made. The following data on animal position within the cage was collected during each observation period and noted on a checksheet (Table 3, adapted from Glassman & Wells, 1984): Cage zone, height of the animal within the cage, substrate the animal is positioned on, angle of substrate, orientation on substrate and orientation of tail. Each cage was divided into six vertical zones, each about 1 1/2 square feet wide, and six horizontal zones each 1 foot in height. The observer sat in front of the cage, visible to the animal, at a distance of about six feet.

To determine the distribution of activity during the 24 hour cycle, activity monitoring treadles were set up on most perches throughout the cage containing two animals. Treadles of thin wood strips were of equal length and width to the perch they covered. Electrical contacts between the treadle and perch sent a pulse through a wire when the treadle was pressed to the perch by the animal's weight. Pulses were registered on an event recorder (Esterline Angus model).

RESULTS

The animals spent almost 60% (698 min) out of the nest box (Table 4). The portion of time spent in their nest boxes was classified as an inactive, non-exploratory period and was not used in analysis of space and substrate use. The most active animal (M#6) was out of the nest box 95% of the observation period. This animal was also observed the most (about 45% of all observations, n=421 min.). In contrast, the second most frequently observed animal (F#2 about 30% of all observations, n=406 min.), spent two-thirds of the observation time in the nestbox. The other two study animals made up the remaining 25% of all observations.

Table 4
Observation time of ringtail possums
Active (visible) vs. Not active (not visible)

Animal	Active		Not Visible	Total		N
F#2	149	12%	257	21%	406	34%
M#5	131	11%	169	14%	300	25%
M#6	393	33%	28	2%	421	35%
M#7	25	2%	36	3%	61	5%
Total	698	58%	490	41%	1188	13
Hours	11		8		19	

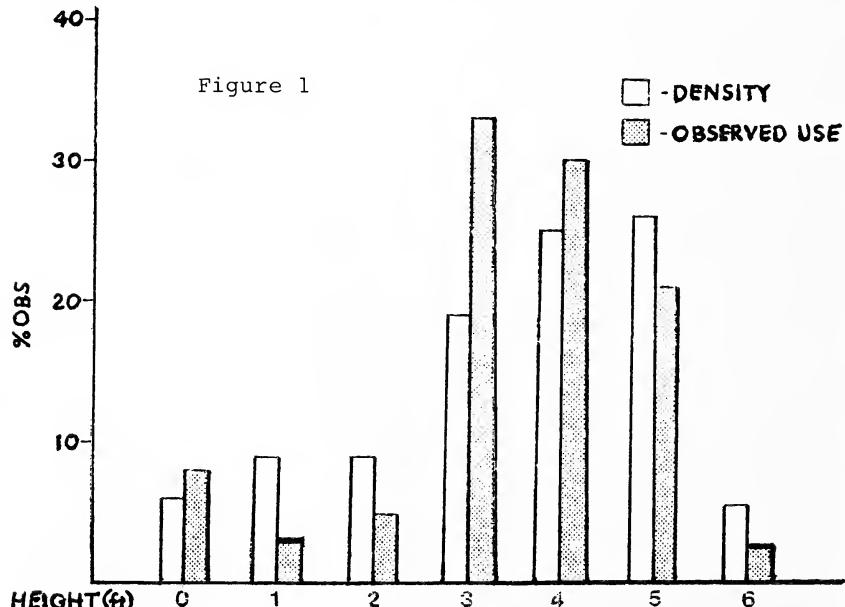
CAPTIVE RINGTAIL POSSUM STUDY, Continued

Space & Substrate Use:

The possums in this study appeared to use fixed paths throughout their cages during nocturnal movements.

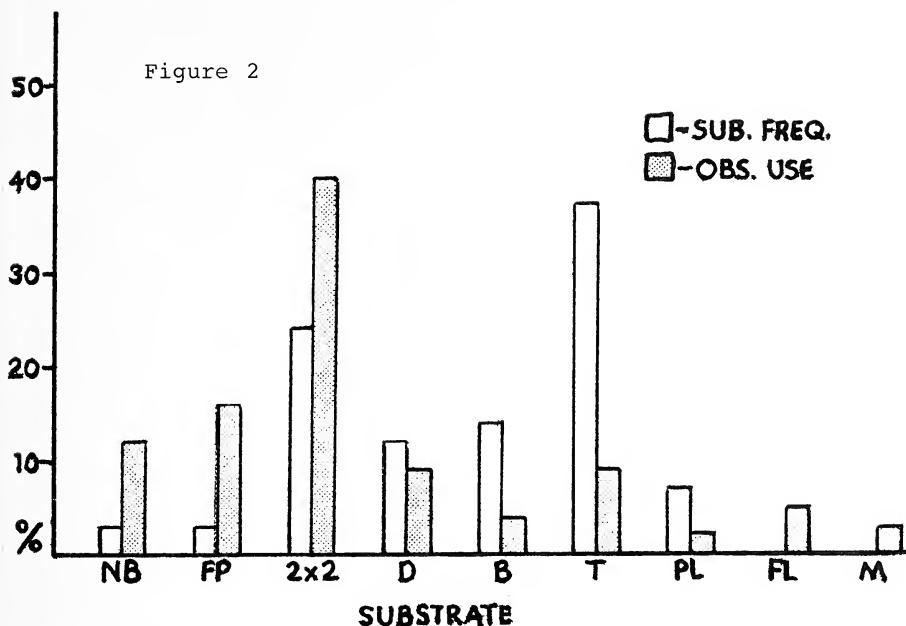
Analysis of spatial use in the study animals revealed that the animals spent almost 85% of total observations active in the three to five foot height ranges (Figure 1). Within each cage substrate density in this height range was high (Figure 2, Table 5). The zero to two foot range was occupied about 15% of all observations while the six to seven foot range was occupied for only 2% of all observations. Although substrate was densest at the five to six foot level animals were most frequently observed in the three foot range ($X^2=17.6$, $p<.001$) (Figure 1; Table 6). Only about 20% of the possum's activity occurred in the five to six foot range. (Table 6). The possums were most active in the three to five foot range (35% of observations) on 2 x 2 wooden horizontal substrates ($X^2=139.4$, $p<.001$) even though trees were greatest in density throughout this height range ($X^2=4.26$, $p<.05$) (Figure 2). The 2 x 2 beams were equally dense throughout this range. Feeding platforms and nestboxes were the next most frequently occupied areas.

The possums seemed to use horizontal substrates more than those set at other angles ($X^2=55.4$, $p<.001$) (Table 6). Moreover, they tended to orient their body parallel to the substrate rather than perpendicular to it ($X^2=86.4$, $p<.001$) (Table 6).

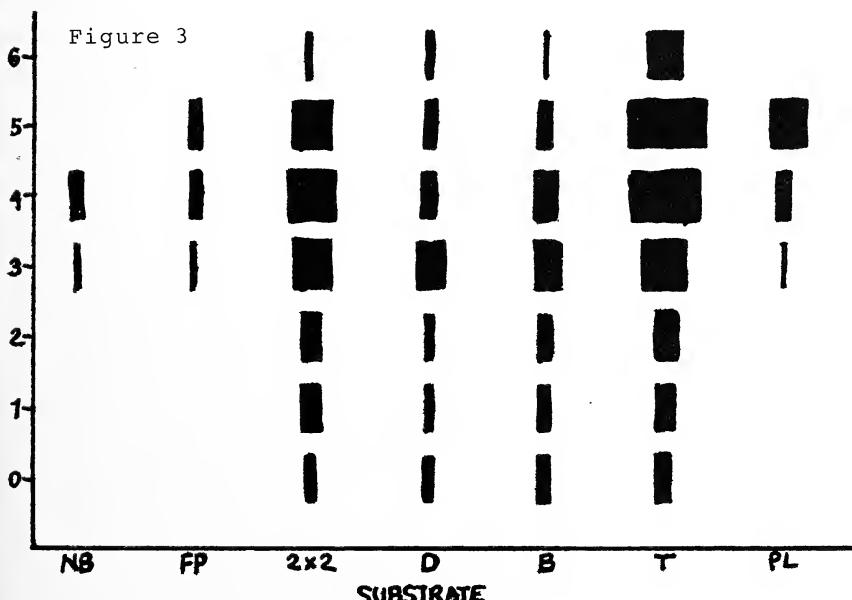


Density of substrates within height zones and observed use of zones by ringtail possums (% frequency and observed use)

CAPTIVE RINGTAIL POSSUM STUDY, Continued



Individual substrate frequency within cages and use by ringtail possums (% frequency and observed use)



Density of substrates through height zones in cages.
Thickness of bar is proportional to density of substrates.

CAPTIVE RINGTAIL POSSUM STUDY, Continued

Height	NB	FP	2 x 2	DOWEL	TREE	BAMBOO	PLANK	TOTAL	PERCENT
0			2.00	2.00	3.00	3.00		10.00	6.41
1			4.00	2.00	4.00	3.00		13.00	8.33
2	2.00	1.00	4.00	2.00	4.00	3.00		13.00	8.33
3	3.00	2.00	8.00	6.00	9.00	6.00	1.00	33.00	21.15
4	4	2.00	10.00	3.00	14.00	5.00	3.00	40.00	25.64
5	5	2.00	8.00	2.00	16.00	3.00	6.00	37.00	23.72
6			1.00	1.00	7.00	1.00		10.00	6.41
TOTAL	5.00	5.00	37.00	18.00	57.00	24.00	10.00	156.00	
PERCENT	3.21	3.21	23.72	11.54	36.54	15.38	6.41		

Table 5 Density of substrates at different heights within possum cages

CAPTIVE RINGTAIL POSSUM STUDY, Continued

Table 6 - Frequencies and percentages of areas and substrates occupied by ring-tailed possums, observed substrate angles, body orientation and tail position.

CAGE ZONE							
1	2	3	4	5	6		
48	26	82	300	140	95		
7%	4%	12%	43%	20%	14%		
HEIGHT							
0	1	2	3	4	5	6	
53	18	33	226	201	145	15	
8%	3%	5%	33%	30%	21%	2%	
SUBSTRATE							
NB	FP	2X2	D	T	B	PL	M
85	112	276	63	59	27	13	24
12%	15%	40%	9%	9%	4%	2%	3%
							FL
							38
ANGLE	NO ANGLE		BODY ORIENTATION				
ANGLE	NO ANGLE		PERPENDICULAR			PARALLEL	
234	425		139			343	
36%	64%		29%			71%	
TAIL POSITION							
HANGING	GRASPING	RESTING	DRAPED	STRAIGHT			
314	45	128	63	89			
49%	7%	20%	10%	14%			

Activity:

Animal activity as recorded by the treadle system over 24 nights revealed a weak bimodal activity period (Figure 4). The possum's activity was high immediately after 1500 hours, then decreased at 1700 hours. Activity rose again at 1900 hours and maintained a somewhat sustained level until 2400 hours when it seemed to start decreasing to zero at 0300 hours.

When activity was simultaneously recorded by the treadles and observed, 75% of the activity was recorded by the treadles during 100% of the observed activity. The event recorder and treadle system provided a conservative record of activity. For an average of 56.5 total minutes of observed activity, while the treadle system was operating, 43.5 minutes, or over 75% of the animal's activity was recorded by the treadles (Table 7).

Tail Use:

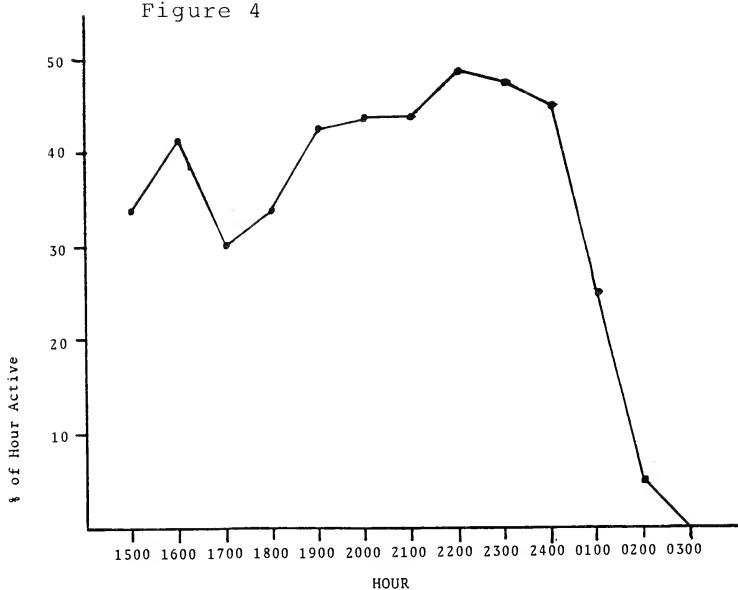
The predominant position of the tail was hanging down from a perch (almost 50%). Next most frequently the tail was observed resting on a substrate (20%) and held straight out (14%). Draping (10%) and grasping (7%) with the tail were seen infrequently (Table 6).

CAPTIVE RINGTAIL POSSUM STUDY, Continued

Table 7 Mean minutes active N= 24 and percent active per hour measured by activity treadle system

HOURS	MEAN MIN. ACTIVE	% HR ACTIVE
1500	19.8	33
1600	24.7	41
1700	18.1	30
1800	19.5	33
1900	24.9	42
2000	25.8	43
2100	25.5	43
2200	28.2	47
2300	27.3	46
2400	26.6	44
0100	14.4	24
0200	2.5	4
0300	0	0

Figure 4



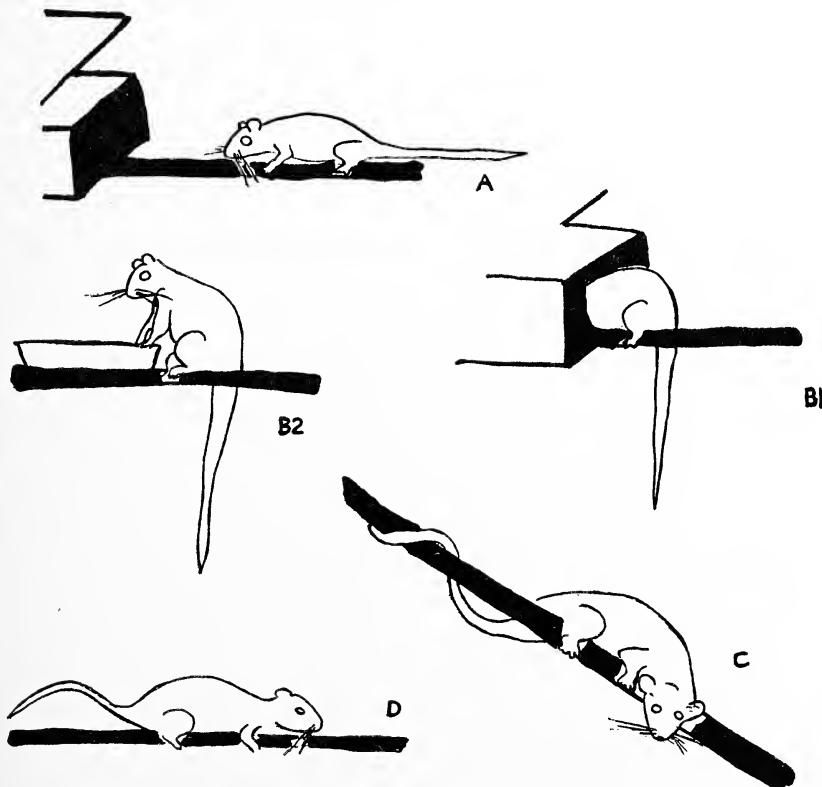
Percentage of each hour that ringtail possums were active as measured by activity treadle system

CAPTIVE RINGTAIL POSSUM STUDY, Continued

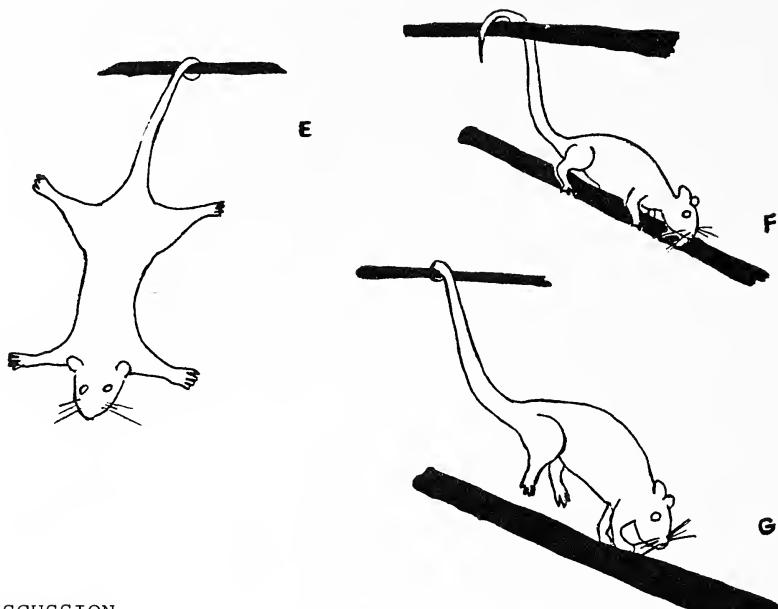
The prehensile tail is used in several interesting ways. Frequently, the tail hangs straight down (Figure B2). Occasionally the tail would swing back and forth as an animal shifted its body from a parallel position to a transverse one across the plane of the branch. As the possum moved along a substrate the tail tended to be held straight out. The female used in this study often carried her tail straight out as a stabilizer as she moved about the cage with one or two youngsters clinging to her back. Often the tail went from straight out to hanging as soon as a moving animal reached a horizontal and relatively thicker and possibly more secure surface (Figures A & B1).

The tail was employed for security in case of a fall, maintaining the animal's purchase through descent (Figures C & G) by grasping a branch above the descending possum, or by draping the tail over a branch behind the animal (Figure G). Tail draping was also observed when animals moved from one substrate to another.

Figures A thru G - diagrammatic representations of various tail positions observed and recorded in ringtail possums: A-straight out; B1 & B2-hanging; C-grasping; D-curled; E-animal hanging by tail; F-draped; G-downward descent using tail to lower hindquarters.



CAPTIVE RINGTAIL POSSUM STUDY, Continued



DISCUSSION

The results of this study suggest that ringtail possums preferred horizontal two-inch thick substrates and occupied heights with high substrate density.

Although Thomson and Owen (1964) described free-ranging ringtail possum daylight movements "along apparently fixed and well known runways with speed and certainty" (p.37), such diurnal activity was only rarely observed in this captive situation. The size of the cages limited the height of the possum's movements and precluded any forest activity described in field studies. My observations did however, reveal fixed paths during nocturnal movements.

Thomson and Owen reported that possums left their nests during the beginning of twilight and were most active in the period just prior to midnight. The animals used in the present study were also quite active after their daylight ended. Since observations on space use occurred during the initial period of activity, a good representative sample of their movements was probably obtained.

The food platform seemed to be a focal point of time and activity. The nest box appeared to be a similar focus. These two sites are large, flat forms and may resemble a tree cavity or tree trunk crotch to the possums. It is also quite possible that the possums focused their activity around the food platforms simply to be near the food. Flat planks four, six and eight inches wide, however, were used only infrequently. In future studies the position and height of the food platform could be manipulated to determine what effect this has on movements and height preferences.

CAPTIVE RINGTAIL POSSUM STUDY, Continued

Although trees were the most abundant substrate in all cages, the possums used the two by two wooden substrates more often. The possums may have used the 2 x 2 perches more because of their preference for that particular diameter perch. More of the 2 x 2 perches were positioned at horizontal or near horizontal angles, another possible preference of the ringtails. There were few two inch diameter tree branches within the cages and of those present fewer were at near horizontal angles.

A possum may have used horizontal substrates as a more stable, supportive perch when it had stopped moving momentarily or was scanning. Horizontal substrates may also provide more stable surfaces for rapid movements through their environment and would therefore be used more frequently. If the tail is used as a balancing mechanism, then horizontal substrates may be mechanically the best and preferred type of perch.

Body orientation similarly may be related to stability. A stance parallel to the perch spreads an animal's body weight over a greater area. In a threatening situation a stable posture would also afford the animal a swift exit in almost any direction or prevent itself from being pushed off a perch.

Although no quantitative data was collected, it appeared that vertical substrates were used almost exclusively for vertical movement and rarely used for perching.

While a prehensile tail might be expected to grasp substrates to prevent falls, grasping or draping the tail was observed infrequently and then only when the animal moved vertically about the cage. From these observations I hypothesized that the tail is used primarily as a counterbalance and secondarily as a fifth hand. Further quantitative studies on tail use are necessary to validate hypotheses on tail use.

Cage use by ringtail possums appears to be governed by substrate type and density as well as strategic placement of focal areas of attention (e.g. food platform, nest box). Based on the preliminary results of this study the species would do well in a highly visible nocturnal exhibit at least six feet in height with dense areas of mixed two inch thick perches at height zones in the vicinity of the feed station and nest boxes.

There is much more to be learned about the housing requirements of ringtail possums. The data of this preliminary study could be subject to further analysis to determine interacting effects between substrate thickness, angle, and height. In addition, manipulation of feed platforms and branch orientations could reveal their effects on possum movements. Our continued research on the ringtail possum and related species may provide zoos with the information needed to display this little known animal in unique and stimulating conditions.

CAPTIVE RINGTAIL POSSUM STUDY, Continued

Acknowledgements

Karen Molinas performed some of the observations on the possums. I thank Miles Roberts, Steve Thompson, Ted Grand and Roberta Wallace for critically reviewing various drafts of the manuscript.

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Chapter News

FRESNO ZOO AAZK CHAPTER

Newly elected officers of the Fresno AAZK Chapter are:

President.....Betty Barkman
Vice Pres.....Paula Swanson
Secretary.....Wattie Anderson
Treasurer.....Jim Wolters

The Fresno Chapter accomplished several things in 1986. At the keepers request, we donated and installed an electrically-cooled water fountain for the staff. We followed this up a few months later with the donation of a microwave oven.

We have also donated funds twice to the Fresno Zoo Society's Staff Education Fund. Funds were also donated to help implement a special signage program (more about this at a later date).

The sale of T-shirts and sweatshirts is our main source of income, so a T-shirt design contest was held to supply a new design. We hope to identify new fund-raising sources in 1987.

---Mary L. Swanson

ZOO ATLANTA AAZK CHAPTER

On 4 February 1987, Zoo Atlanta AAZK held elections for the new year. New officers are:

President.....Ellen Bradfield
Vice Pres.....Tim Kurkowski
Sec/Treas.....Gary Roesinger
Chapter Liaison...Tim Kurkowski

Zoo Atlanta AAZK, with the help of public donations gave World Wildlife Fund a check for \$800! We look forward to a year full of exciting fund-raising and projects!

---Tim Kurkowski

PITTSBURGH CHAPTER

The Pittsburgh Chapter started 1987 with the election of officers. Those to serve this year are:

President.....Regina Grebb
Vice Pres.....Kathy Robbibaro
Secretary.....Karen Lindquist
Treasurer.....Ray Bambrick

Our Chapter has some exciting projects planned for the coming months, including the appointment of a Chapter archivist, and the collection and establishment of a Pittsburgh Zoo memorabilia display.

----Kathy Robbibaro, V.P.

PHILADELPHIA CHAPTER AAZK

Current officers for the Philadelphia AAZK Chapter are:

President.....Denise Robinson
Vice Pres.....Bob Murch
Secretary.....Roseann Giambro
Treasurer.....Eileen Gallagher
Chapter Liaison...Denise Robinson

As a fund-raiser the Chapter has held a Keeper's Night where members of the Zoo get to talk with keepers about their areas and in certain areas members can get behind-the-scenes tours. Average income is \$100-\$150. At their monthly meetings, keepers show slides of past zoo trips and sometimes a film is rented.

EAST BAY CHAPTER AAZK

This Chapter includes members from the Knowland Park/Oakland Zoo. Current officers are:

President.....Alan Varsik
Vice Pres/Treas.....Bill Garrison
Secretary.....Karen E. Brown

CHAPTER NEWS, Continued

BURNET PARK ZOO CHAPTER

The Burnet Park Zoo Chapter was very busy last year preparing for our reopening on 2 August 1986. We did manage to hold monthly meetings and produced a braille guide to the zoo.

This year our chapter feels there will be more time to pursue projects and already have many in the beginning stages.

We have elected officers for 1987. They are:

President.....Alan Baker
Vice Pres.....Peggy Arquette
Secretary.....Krista Larrow
Treasurer.....Laina Matteson

---Peggy Arquette,
Chapter Liaison

ATTENTION CHAPTERS! Please send National HQ a piece of your Chapter letterhead or a photocopy of your Chapter logo. We want to keep a file of logos so that when a new Chapter wants to design a logo, duplications can be avoided. Thanks!

FLINT HILLS CHAPTER

The Flint Hills Chapter, Sunset Zoo, Manhattan, KS, recently elected new officers for 1987. They are:

President.....Mike Quick
Vice Pres.....Ron Schulze
Secretary.....Mary Haines
Treasurer.....Dianne Roberts
Chapter Liaison..Tim Marshall



Keeper's Alert

FOUNDER'S WEEKEND UPDATE - The price for the limited edition, commemorative T-shirts has been reduced to \$15.00 each. Only 250 numbered shirts will be printed in honor of AAZK's 20th Anniversary 'Founder's Weekend' 5--7 May 1987. To order send size, number desired and check or money order made payable to "Art Goodrich" to: Art Goodrich, AAZK Historian, Mammal Dept., San Diego Zoo, Box 551, San Diego, CA 92112.

Also, if you need more information on Founder's Weekend, see the gold insert in the February 1987 issue of **AKF** or write to Art for an information/registration packet at the address above.

Dan Badgley, reptile headkeeper at the Columbus Zoo, will lead a tour 20 April - 3 May to Costa Rica. The tour will emphasize the natural history of Costa Rica, with special interest given to amphibians and reptiles. A wide variety of habitats will be toured, including Monteverde cloud forest at the time most probable for seeing the Golden Toad. Cost is \$1995, including a \$150 donation to the Columbus Zoo. For further details, contact Dan at the Columbus Zoo, 9990 Riverside Dr., Box 400, Powell, OH 43065.



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Need membership information? Want to learn more about AAZK or start a chapter or become more active - then call your RC! There are still openings for RC positions for (1) the states of TN, NC, SC, W. AV) and (1) the states of MI, IN, KY, OH. If you are interested, please contact Diane Krug, Eastern U.S. Regional Co-Director. You may call Diane collect at her home phone (904) 845-4279) evenings after 6 p.m. EST. These two positions offer a great opportunity to become involved in AAZK and to provide a valuable and necessary service for the Association.

Institutions wishing to advertise employment opportunities are asked to send pertinent data by the 15th of each month to: Opportunity Knocks/ AKF, 635 Gage Blvd., Topeka, KS 66606. Please include closing dates for positions available. There is no charge for this service and phone-in listings of positions which become available close to deadline are accepted.

ZOOKEEPER/SMALL ANIMAL...experience with birds and/or reptiles preferred; responsibilities may include all small animal forms. Salary \$12,504-\$14,508 commensurate with experience, plus benefits. Send resume by 24 March 1987 to: Personnel Department, City of Abilene, P.O. Box 60, Abilene, TX 79604.

ELEPHANT HANDLER...requires one year experience with elephants. Will assist trainer and participate in African elephant husbandry program and exotic hoofstock management. Salary \$1,205-\$1,541 per month, benefits. Applications accepted until position filled. Send resume to: Mike Blakley, Curator of Mammals, Kansas City Zoo, Swope Park, Kansas City, MO 64132.

INTERNSHIP...the Friends of the Salisbury Zoo has established an annual internship to honor the memory of Bruce MacNelly, one of our young keepers, who died after a brief illness in 1986. The FOSZ will pay an honorarium of \$500 to assist with travel or living costs. Applications are invited from persons who are, or wish to become professional zoo keepers, and who would benefit by working in a small zoo for three months. Preference will be given to residents of the Delmarva Peninsula, but all will be considered. A resume and personal handwritten letter, with names of three persons to whom reference may be made should be sent to the Director, Salisbury Zoo, P.O. Box 3163, Salisbury, MD 21801 before 30 April 1987. Inquiries by letter are welcome.

ZOOKEEPER...requires associate degree in animal science, BS in Biology or related field. One year's paid experience desired. Avian and/or herpetological expertise emphasized. Salary \$10,000-\$11,000, plus benefits. Send resume by 20 March to: Laura Trechsel, General Curator, Folsom Children's Zoo, 2800 A Street, Lincoln, NE 68502. EOE.

EDUCATION INTERNSHIPS...available in the areas of art, science and outdoor recreation. Instructors will work under the direction of education department staff in planning, conducting and evaluating zoo day camp sessions for preschoolers through fifth graders. Two years' college work in elementary education or environmental interpretation or applicable experience preferred. Salary \$150/wk. for 10-week internship from 22 June through 28 August. Send resume and letter of intent by 15 April 1987 to: Jay Jasan, Assistant Director of Education, Staten Island Zoo, 614 Broadway, Staten Island, NY 10310.

HEAD KEEPER/ASSISTANT CURATOR...will oversee 500 animal collection and supervision of keeper staff, landscaping and exhibit design. Bachelor's degree and/or zoo supervisory experience preferred. Send resume before 25 March, 1987 to: Benson's Animal Park, 27 Kimball Hill Rd., Hudson, NH 03051, Attn. Mika Nurmikko, General Curator.

VETERINARY TECHNICIAN...position open at Topeka Zoological Park. For information, contact: Dr. Stan Jensen, 635 Gage Blvd., Topeka, KS 66606 (913) 272-5821.

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Mail this application and check or money order (U.S. CURRENCY ONLY PLEASE), payable to American Association of Zoo Keepers, Inc., to: AAZK National Headquarters, Topeka Zoo, 635 Gage Blvd., Topeka, KS 66606.

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Articles sent to *Animal Keepers' Forum* will be reviewed for publication. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Those longer than three pages may be separated into monthly installments at the discretion of the editorial staff. The editors reserve the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope.

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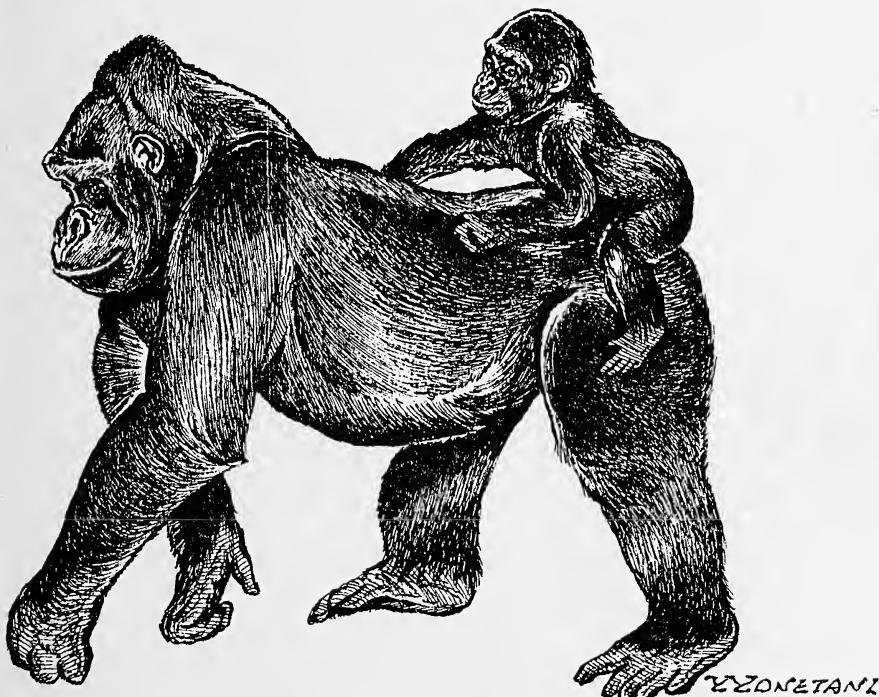
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April 1987
Volume Fourteen
Number Four

Animal Keepers' Forum (ISSN 0164-9531) is a monthly journal of the American Association of Zoo Keepers, Inc., 635 Gage Blvd., Topeka, KS 66606. Five dollars of each membership fee goes toward annual publication costs of *Animal Keepers' Forum*. Second Class postage paid at Topeka, KS. Postmaster: Please send address changes to:

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Keeper Training Materials Identification

Rosemary Jalink, Mill Mountain Zoo

Reference Search

Liz McLaughlin, Roger Williams Park Zoo

Jenny Rentfrow, Mason, MI

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Susan Bunn, Minnesota Zoo

Biological Values/Gestation

Greater S. F. Bay Area Chapter

Library Resources

Kaci Thompson, NZP

Infant Development Notebook

Steven Wing, Milwaukee Zoo

Nominations & Elections

Janet McCoy, Washington Park

Zoological Gardens

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States East of the Mississippi - Diane Krug, White Oak Plantation, Yulee, FL

States West of Mississippi - Debbera Stecher, Woodland Park Zoo, Seattle, WA

Individual Regional Coordinators and the states under their oversight are listed elsewhere in each issue of AKF.

This month's cover features a mother and infant lowland gorilla (*Gorilla gorilla gorilla*) by Yoshi. Yonetani, of ZooDEL (Zoo Design and Education Lab) of Kobe, Japan. Members of the great ape family, gorillas live in family social groups made up of a dominant adult silverback, one or more immature blackback males and a number of females and their offspring. Gorillas are for the most part strictly vegetarians and despite their impressive size and strength are shy and gentle animals except when threatened. Native to Africa, all gorilla species are endangered due to habitat destruction and poaching for illegal trophies. Thanks, Yoshi!

SCOOPS AND SCUTTLEBUTT

AKF Takes on New Look

With the arrival of the Macintosh Desktop Publishing system at AAZK National Headquarters, not only AKF, but other publications, correspondence etc. will be taking on a new, and we hope more professional look. The equipment was installed in late February and both the Administrative Secretary Barbara Manspeaker and AKF managing editor Susan Chan have been learning the ins and outs of the new technology. Besides the publications aspects of the new equipment, all AAZK records including membership lists and financial spreadsheets will be kept on the new computer.

In the months ahead you will be seeing a number of changes in the format of *Animal Keepers' Forum*. We ask your patience and understanding while we improve our computer skills. We are very excited about the broad range of possibilities the new equipment offers the editorial staff and we hope to continue to improve AKF as the months go by.

AAZK President Jean Hromadka and Vice President Frank Kohn visited National HQ in Topeka in March to view the new equipment and to go over some mid-year AAZK business. Both were impressed with the capabilities of the system and enthusiastic about the positive changes it will allow us to make. Keep watching every month to see your journal improve and reflect a more professional image for AAZK!

AAZK Awards Deadline Getting Closer

The deadline for submitting nominations for the various AAZK awards is 1 June 1987. Awards are presented each year at the National Conference. For information on the various awards and the nominations procedures, please see the January, February and March issues of AKF. Each has a page devoted to a particular award and gives all the information you will need for submitting a nomination. All nominations should be sent to: Rachel Rogerds, AAZK Awards Committee Chairperson, Metrozoo, 12400 S.W. 152 St., Miami, FL 33177.

ATTENTION ALL PROFESSIONAL AAZK MEMBERS!

Elections for new members of the AAZK Board of Directors will be held soon. Ballots and biographies on the candidates will be sent to all professional AAZK members in April. Enclosed with each ballot will be a self-addressed envelope in which to return your ballot. Please take the time to cast your ballot and show your support for the Association. Don't Forget To Vote! It just takes a moment of your time. Remember only Professional members in good standing are permitted to vote.



COMING EVENTS

AAZPA Southern Regional Conference

May 3-5, 1987

Tampa, FL

For more information contact: Judith Breuggeman, Education Coordinator, Busch Gardens, Box 9158, Tampa, FL 33674 (813) 988-5171.

AAZK 20th Anniversary "Founders Weekend"

May 5-7, 1987

San Diego, CA

Held to honor the original founders of AAZK, the "weekend" will include workshops, tours, banquet, etc. For an information/registration packet contact AAZK Historian Art Goodrich, Mammal Dept., San Diego Zoo, Box 551, San Diego, CA 92112 OR see the February AKE for the gold insert which contains both registration form and hotel accommodations form.

Botanical and Wildlife Art Show

May 14-17, 1987

Los Angeles, CA

For more information contact: Patti Glover, Los Angeles Zoo, 5333 Zoo Drive, Los Angeles, CA 90027 (213) 664-1100.

The 11th International Herpetological Symposium on Captive Propagation and Husbandry

June 17-20, 1987

Chicago, IL

For more information contact: Richard Hahn, Zoological Consortium, Inc., 13019 Catoctin Furnace Road, Thurmont, MD 21788 (310) 271-7488.

First International Children's Zoo Symposium

July 1-4, 1987

Philadelphia, PA

As we all know, keepers are essential for the successful learning experience of the casual visitor to a Children's Zoo. Keeper participation is also essential for a successful Children's Zoo Symposium. We would like keepers to present papers and participate in workshops during this symposium. The symposium will focus on History and Philosophy, Design and Learning, and Animal Collection and Purpose. There will be pre- and post-conference trips to the Bronx and Baltimore Zoos plus much more. Registration is \$100.00. For further information contact: Robert Callahan, Curator of Children's Zoo, Philadelphia Zoo, 34th St. & Girard Ave., Philadelphia, PA 19104 (215) 243-1100, Ext. 300.



Births & Hatchings



After a long-term behavioral study, hundreds of urine samples and carefully monitored trial introductions of females to the male, a baby Tamandua (*Tamandua tetradactyla*) has been born at Lincoln Park Zoo (Chicago, IL). This is the sixth captive birth in the free world, and only the second to be mother-raised. The infant, apparently a male, was born to Coletto and Nina on 18 November 1986, with eyes open, and a tendency to rear up and defend himself when left in the nest as mom moved away to eat, and against even her as she returned. By the end of January the infant started trying the adult diet, a sort of meat milkshake, but continued to nurse through February. This rare birth is the second at Lincoln Park. Five-year-old Jose is the surviving twin of another pair. *Submitted by Pat Sammarco, Keeper, Lincoln Park Zoo.*

Metro Toronto Zoo's continuing commitment to conservation efforts has paid off with the birth of a pygmy hippopotamus on 15 February 1987. "Psi", the father, was born at the National Zoo in Washington, DC, on 23 October, 1972, and came to MTZ on 18 July, 1973. "Hilda", the mother, was born at the Basel Zoo in Switzerland on 13 March, 1972, and arrived at MTZ on 6 September, 1973. This is her fourth calf. The baby, as yet unsexed, is quite small although it has not been weighed as yet. Typical birth weight for this species is between 4.5 and 6.2 kilograms. The gestation period for the newborn was 202 days.

Another significant birth occurred on 6 March at Metro Toronto Zoo with the arrival of a baby Bornean Orangutan born to the female "Abigail". *From Metro Toronto Zoo News Release.*

The following B&H were reported in the March issue of The Keeper, the newsletter of the San Diego Chapter of AAZK: Eighteen Chinese crocodile lizards (*Shinisaurus crocodilurus*) were born at the end of 1986 to two females. As far as is known, this is the highest birth ratio recorded for this species. Two baby Asiatic small-clawed otters (*Aonyx c. cinereus*) have been observed in the Southeast Asia Tropical Rain Forest. The birthdate of the offspring of "Todd" and "Endora" was estimated to be 1 January. This is Endora's first litter. Following a change to more natural management, the animals were allowed to prepare their own burrow. Apparently it worked as these were the first pups since 1981. A Somali wild ass (*Equus asinus somalicus*) born on 28 October 1986 has been moved to the Wild Animal Park to become part of the breeding colony there. He is the first hand-raised Somali ass in the world. At the Koala exhibit, "Adele", mother of the Park's first koala offspring "Sydney", has done it again: one of the keepers saw a little leg sticking out of her pouch in February.

(Editor's note: Spring is upon us and we know that means lots of B&H at your facilities! Let us hear from you. Please submit B&H in the format illustrated above. Submit B&H by the 15th of each month.)



KEEPER'S ALERT

THE PHILADELPHIA CHAPTER IS PLEASED TO ANNOUNCE that it will reimburse the \$100 registration fee for a keeper attending the International Children's Zoo Symposium July 1-4 1987 in Philadelphia. The recipient will be chosen in a random drawing on July 1.

THE POSITIVE EFFECTS OF CONFERENCE PARTICIPATION

By

*Jean Hromadka, President AAZK
San Diego Wild Animal Park
Escondido, CA*

During the months of September and October, I had the opportunity of attending two national conferences held annually by the American Association of Zoological Parks and Aquariums (AAZPA), and the American Association of Zoo Keepers (AAZK). The 62nd Annual AAZPA Conference was held in Minneapolis, MN from 14-18 September. Later that month, AAZK held her 12th National Conference in Winnipeg, Manitoba, Canada from 28 September to 2 October.

Since I am presently serving as AAZK's National president, I was sent to AAZPA's conference to represent the Association. While I was there I participated in their yearly "Poster Session" whereby individual wildlife organizations and projects are displayed visually in billboard form. You are also assigned a table to make available to anyone interested additional information about your individual organization and its goals. Throughout the week I was able to meet many AAZPA delegates from zoo directors to students trying to find employment in the field. Many approached with encouraging remarks about AAZK, especially zoo administrators. Numerous zoo directors paused at my table to announce that they had sent zoo keepers to AAZK conferences in the past and were planning on sending one or two to the one coming up. I was astonished that so many members were familiar with AAZK's two publications, Biological Values for Selected Mammals and Zoonotic Diseases, both of which were highly praised. Another AAZK project which has won favor and is used regularly in over 129 zoos, animal parks and other private institutions, is our Animal Data Transfer Forms. Of course all the various AAZK brochures and complimentary issues of *Animal Keepers' Forum* arranged on the display table would quickly disappear before I had time to replenish my stock.

Presently, AAZPA and AAZK are working jointly on certain projects and committees so that we will not duplicate our efforts, but rather compliment them. A new network has been formed called the Consortium of Aquariums, Universities and Zoos (CAUZ) founded by Donna Fitzroy Hardy, Ph.D. at California State University Northridge. Although this network is not established or controlled by either AAZPA or AAZK, both are necessary components within the CAUZ network if it is to be able to fulfill its projected goals. The main function of CAUZ is to serve as a communications link between zoos, aquariums and universities and their scientists and educators. Another exciting benefit AAZK realized through her involvement with this AAZPA conference were the contacts I was able to establish with animal facilities located throughout South America. Representatives from these countries came to report not only on their successes but their failures as well, and to seek assistance from those willing to offer it. AAZK can once again exercise its goals stated in the constitution by sponsoring South American zoo keepers, facilities and animal protection groups through our Chapters or individual AAZK members. As we are supporting Indian zoo keepers with sponsored memberships and providing zoo-related materials, so we can accomplish the same for our sister zoos in South America.

The American Association of Zoo Keepers held their 12th National Conference in Canada hosted by the Assiniboine Park Zoo AAZK Chapter. Of course the majority of delegates attending this conference were zoo keepers. For the past six years I have been attending AAZK national conferences like it was an instinctual annual migration which I must perform. This year was probably the most difficult since I was participating as the Association's president. On the other hand, probably what made this task so simple is that the AAZK organization is completely operated and supervised by its members, **zoo keepers**. Since many of the members actively involved with a committee or project attended this conference, I was relieved as well as reassured that the Association's future is not determined by a handful of individuals but by progressive keepers who are willing to sacrifice to help upgrade our profession.

Over 133 delegates attended this conference representing all of North America as well as one delegate from Ireland and another from Australia. Conference activities varied from paper sessions, field trips to Assiniboine Park Zoo and Oak Marsh Hammock to special workshops and zolympics. The host Chapter provided many of the meals and scheduled events free to the

THE POSITIVE EFFECTS OF CONFERENCE PARTICIPATION, *Continued*

delegates allowing the conference to remain fairly inexpensive. Obviously, the Winnipeg keepers worked long and hard for this event for it reflected in every well-organized activity that was planned during the week. Whenever a function runs as smoothly as this conference did, you know that a lot of forethought went into it.

Each year the AAZK organization grows a little stronger and this is reflected at the annual meeting. Through the board meetings which are held at the beginning of the week and are open to all members, we are able to discuss in detail Association business and make any necessary decisions for all of AAZK's various commitments. A summary of the organization is then presented at the Annual Membership Meeting to make the membership aware of AAZK's progress and needed adjustments. Two changes were made in the constitution after a vote by the membership had been taken. First of all, those AAZK members serving on the Nominations and Election Committee may not be nominated or run for a National board position while serving on this committee. Secondly, any Chapter product using the AAZK logo or acronym must split the profits 50/50 with National. It was also approved that any Chapter product that uses just the acronym (like individual Chapter T-shirts or Chapter patches) may sell their goods at any animal-related conferences without splitting the profits with National. This would not be allowed for any of the AAZK logo items like the belt buckles, coffee mugs, AAZK T-shirts and baseball caps.

Over the year AAZK has taken a number of important steps. During the early part of 1987, the AAZK National Headquarters located in Topeka, KS will, for the first time in the Association's history, have a computer system best suited for our organization finally installed. Through our International Affairs Coordinators we have developed a sponsorship program for zoo keepers in Third World countries whereby Chapters and individuals can 'adopt' a keeper and provide membership fees and educational materials. We have also been recently appointed an active branch of the CAUZ network and are involved with another proposal to develop curriculum for a Keeper Training Workshop. Two of our publications will be made available on a book list put out by Wildlife Publications. A video tape depicting the role of a zoo keeper is in the planning stages with a PBS station in Arizona. Three more publications are presently striving for completion, two of them are notebooks which deal with diets and mother-reared animals; the other is a book dealing with zoo keeping fundamentals which we hope to have in rough draft form by the middle of 1987. All of these projects are still in need of your feedback. They are all keeper-oriented projects that we created to enhance the zoo keeping profession. Completion of these on-going projects will only be possible through your involvement.

Countless are the benefits after attending a conference. Not only do you make many valuable contacts, but the knowledge gained through papers presented and from personal conversations with delegates can be integrated into your professional duties. Most of us return overwhelmed with enthusiasm and tireless energy which we immediately attempt to transfer into our daily routines. I was very proud to be a part of both conferences for they remind you how much work there is still left to do and no matter how small the contribution you make to this field, it does help make a difference.



Notes on Secondary Pneumonial Death in an Infant Baird's Tapir

By
Pat Hook, Senior Keeper
Riverbanks Zoo, Columbia, SC

On 14 October, 1985, a female Baird's tapir (*Tapirus bairdii*) gave birth to her fourth offspring at Riverbanks Zoo. On 16 October, a physical examination was given to the apparently healthy neonate. No abnormalities or problems were discovered at that time. However, on 25 October, diarrhea was found. No other clinical signs were manifested. Despite immediate therapy, based on observations and laboratory cultures, the animal's condition deteriorated by 23 November to a point necessitating removal from his mother and placement in the zoo hospital. He was found cold, weak, unable to walk unassisted, and with a pale color to his gums. Intense therapy ensued, including round the clock treatment by staff veterinarians and keepers. In spite of everyone's efforts, the animal died on 27 November.

The histopathological evaluation received from the University of Georgia Department of Veterinary Pathology indicated two conditions. Most of the gut sections appeared normal. However, several small areas contained dead cells covered with debris. The submucosa in these areas was fluid filled. No bacteria was seen in the gastrointestinal tract and the changes within suggested viral etiology.

Abnormalities in the lung section included bacteria caused thickened tissue covered by a layer of necrotic inflammatory cells. In several areas on the surface of the lung were accumulations of bacteria. The functional tissue of the lung had collapsed in most areas and some of the air cells in the lung contained white blood cells used to fight the bacterial pneumonia.

In conclusion, the actual cause of death, bacterial pneumonia, was considered a resultant condition of the original problem of an intestinal virus. No evidence of a virus was found in the lungs indicating that the route of infection of the virus was through ingestion. It is believed that the virus weakened the animal thereby making him a suitable candidate for bacterial pneumonia.

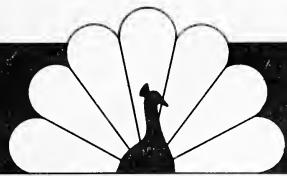


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Berkeley--The University of California Research Expeditions Program (UREP) is currently recruiting field team members from the general public to join animal behavior expeditions heading for Africa, Australia, South America and the Caribbean. Working with scientists from the University of California, the UREP teams will conduct population studies of marine birds in the Aleutian Islands, track forest monkeys in Kenya's Kakamega forest and investigate the parenting habits of sea lions in Baja.

No previous experience is necessary to join the expedition, although the patient observation skills most animal watchers have developed are a definite bonus. As in all UREP expeditions, participants help fund the research by making a tax-deductible contribution to join the team. This contribution also covers participant costs for food and accommodations during the expedition. Most expeditions depart during June and July. For further information and a free expedition catalog, contact: University Research Expeditions Program (UREP), University of California, Desk D-10, Berkeley, CA 94720 or call (415) 642-6586.





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HAVING A BALL WITH BEETLEMANIA

BY

*David Thornton, Elephant Keeper
Brookfield Zoo, Chicago, IL*

Maintaining the world's only collection of captive dung beetles may seem like a difficult task, but to the Pachyderm keepers at Chicago's Brookfield Zoo, it's all in a day's work. In fact, the beetles have made the keeper's job easier.

"Before we obtained the beetles," said Joanie Stinson, Pachyderm Supervisor, "cleaning the African elephant yard required at least two man hours per day. Now, including maintenance of the beetles, the job takes only four hours a week."

Taking care of the beetles, all 150 of them, is actually very simple, explained Lead Beetle Keeper David Thornton. "The beetles are released into the yard at 5:00 p.m., when the elephants are brought in for the night. We rake up the excess hay, and when the beetles have finished "rolling", we pick up the balls. The beetles are then called back to their boxes and fed. The beetles receive Purina Beetle Chow with some chopped fruit added."

There have been a few problems. "It took about five weeks to train them to return to the night boxes at a whistle," said Joanie, who is also head beetle trainer, "they're actually quite intelligent for insects, and once they realized their food was in the boxes, they came right in."

And then there's Jo-Jo. "It's interesting how easily you can learn to identify individuals, even among over 100 animals. Missing legs, different colors or markings, even behavior, who's first or last to the box, can all be used. But there is no mistaking Jo-Jo," David laughed.

"Jo-Jo is the largest, most aggressive, mature male dung beetle found anywhere," states Tawny Carlson, Beetle Liaison for the Phoenix Zoo, as well as originator of the Brookfield herd. Tawny spent one week in Africa researching the behavioral and nutritional requirements of the dung beetle and was an active participant in the collection of the founder stock of 50 beetles.

"Jo-Jo was one of our founder stock, but at the time he was unremarkable. It was during his first two months of captive life that he began to grow and grow. He stopped growing about six months ago, at almost twice normal size. It was about a month later that he went into his first musth," related Tawny.

Musth is a period of aggressive behavior in males previously thought to occur only in elephants. David was the first to spot it. "I went out to rake and then collect the beetles, when suddenly there came this enormous dung ball. I stepped out of the way, but it followed me as I backed into the wall. I was able to push away the ball with my rake, but then I was face-to-face with Jo-Jo. He had this wild-eyed look and was snarling. I slowly backed to the door, talking quietly and using the rake to fend off his occasional charges. I'm just lucky I knew what to do!" David said.

This unheard of phenomenon has attracted scientists from all over the world, including Susie Kasielke, Beetle Liaison at the Los Angeles Zoo, as well as an expert in musth males.

"Jo-Jo displays all the characteristics of a male elephant in musth," she stated. "He is aggressive, vocal, and unresponsive to commands. Jo-Jo refused to enter his night box for three days the first period. At present, he enters musth approximately every six months for about a two-week period, at which time he allows only Joanie and David in the yard. All other keepers are chased into the moat."

Aside from Jo-Jo, the other beetles are usually well mannered. There are occasional squabbles over food or choice dung, but they end quickly. Over the past thirteen months the population has grown from fifty to one hundred-fifty, which is near capacity here. Any more and there's just not enough dung," said Tawny.

HAVING A BALL WITH BEETLEMANIA, *Continued*

In addition to Phoenix and Los Angeles, there are a few other institutions interested in forming their own herds. The advantages of easier cleaning associated with a possible mixed species exhibit prove quite appealing, and not just with pachyderms, Susie reports. "We are interested in beetles for all our hoofstock areas, not just the elephants."

At Brookfield, keepers plan to start a second herd for use with the Black Rhinoceros yard. There are also plans being developed to include a beetle herd in the African Plains exhibit, due to begin construction sometime. But will there be more males like Jo-Jo?

"One day, all zoos will have at least one herd," related Joanie, "but there will only be one Jo-Jo. He's young now, and we hope he will be around for a long time. No other male can match his size, he is truly magnificent." She glanced at the photos of Ziggy, the legendary bull Asian elephant, and Brookfield's "other" rogue animal.

"At least I hope there not another Jo-Jo!"

(Editors note: Thanks to Brookfield's David B. Thornton and Joanie Stinson, Phoenix Zoo's Tawny Carlson, and Los Angeles Zoo's Susie Kasielke for this bit of April Fool's whimsy.)



Jersey Wildlife Preservation Trust Breeding and Conservation of Endangered Species Summer School 1987 (August 1-22, 1987)

The course is aimed at zoo staff and students who wish to further their interests in conservation and in breeding of endangered species in captivity. This year's course will be on the behavior, reproductive biology and conservation of endangered species.

The program is intensive and includes lectures and discussions, practical instruction with zoo staff, and research, preparation and presentation of individual projects using Trust facilities for behavioral observation, laboratory investigation, record research and reference material.

Course Directors: Dr. Roger Avery, Senior Lecturer in Zoology, University of Bristol; Dr. Simon Beader, Senior Lecturer in Anthropology, Oxford Polytechnic, England; and the Trust's Training Officer, Dr. David Waugh.

Residential course fee: approximately \$830.00 (US)

Further details and application forms are available from: Summer School Coordinator, Jersey Wildlife Preservation Trust, Trinity, Jersey, Channel Islands, British Isles. Closing date is 30 April 1987.



Evaluating Forage Fed to Exotic Animals

By
Charlotte Kirk
Animal Health Technician
Kansas City Zoological Gardens
Kansas City, MO

Making sure that the food we feed our captive animals is of good quality is part of our job as zookeepers. Admittedly, it is not so difficult to determine when milk is sour, fruit is rotten, or meat is spoiled; but it can be difficult to determine the quality of the hay we feed.

Since hay makes up approximately 75% of our hoofstock's total diet, it's important that it be of good quality. It has been documented that East African herbivores spend the majority of the day foraging. The giraffe spends 68% of its day feeding (Leuthold, 1978), the elephant 74% (Van Soest, 1982), and the rhino 50% (Owen-Smith, 1973). Most other exotic ruminants spend 50-70% of the day foraging in their natural habitat. In captivity, these animals depend on hay as their major source of energy. If that source is not of good quality, problems may be encountered.

Certainly we have all had to deal with poor quality hay at one time or another. Often times it's difficult to assess the quality of hay. So to make life easier, here are a few tips that may strengthen your ability to tell a good bale of hay from a bad one.

Both legume and grass hays should have fine stems and plenty of leaves. If legume hay looks more like a pile of sticks, due to lack of leaves, it was probably put up too late. Leaf loss means major nutrient loss. As forage matures, quality declines due to increased stem to leaf ratios, increased fibrousness, translocation of nutrients, and weathering (Gesshe & Walton, 1981). Nutrient value declines since stems are more fibrous, are 8% less digestible, and contain 6% less protein than leaf tissue (McCallum, 1983).

Check for weeds and foreign objects in the hay. More of these mean less desirable forage materials. Many weeds can be toxic to the animals we feed. Cocklebur (*Xanthium spp.*), ergots (*Claviceps spp.*), morning glories (*Ipomoea spp.*), and mustard weeds (*Thlaspi arvense*) are just a few of the weeds that are toxic to most animals, especially swine. Jimsonweed (*Datura spp.*) and nightshades (*Solanum spp.*) are weeds commonly found in hay that produce powerful toxins (Kirk, 1983). Familiarizing yourself with toxic plants can help you to recognize these potential health hazards. Foreign objects to look for can include anything from pieces of baling wire and nails to insects. The insect most famous for causing problems in equines is the blister beetle. This small striped insect is commonly found in alfalfa hay. The toxicity of blister beetles is due to the cantharidin found in their body fluid (Oehme, 1983). Cantharidin is a severe irritant that produces vesicles (or blisters) in the digestive tract when ingested. When this material is absorbed, it is rapidly excreted through the kidneys, causing damage to the urinary system. Depending on the number of beetles consumed, the equid may show mild to severe signs of toxicity which may even lead to death.

Note the color of your hay. Although a bright green color is often a sign of good hay, it is not the most accurate sign of quality. Sometimes a bale of hay may be sun bleached on one side but full of nutrients when it's opened.

You can sniff out mold and dust. Temperature and moisture are the factors that most affect the growth of mold. Approximately fifteen species of *Penicillium* and *Aspergillus* thrive in hay stored between 25-35 degrees C (77-95 degrees F) and 75-90% relative humidity. This can be a severe problem in the warmer summer months in many parts of the country. Young animals of all species are most susceptible to mold toxins (Berrier, 1977). If there is a blue-gray cloud of dust when you separate a flake of hay, and you come away gasping and sneezing, you can bet that hay is full of mold that could easily cause respiratory and circulatory disturbances in the animal you are feeding.

EVALUATING FORAGE FED TO EXOTIC ANIMALS. *Continued*

Texture is also important in assessing the quality of hay. Good hay is soft and springy. Bristled and clumped hay is usually of poor quality.

Lift the bale. If it feels like a ton of bricks, it is more than likely a block of mold. Heavy bales can also mean wet bales which besides being excellent growth medias for mold, usually are lacking in digestible energy.

Obviously no hay dealer is going to allow you to be turned loose opening every bale, but it is wise to crack open at least two or three. Look for the obvious factors that determine quality: leafiness, color, texture, moisture, and the presence of foreign objects. Of course, we can't predict the quality of our hay, but we can control what we feed by careful and serious inspection on a daily basis.

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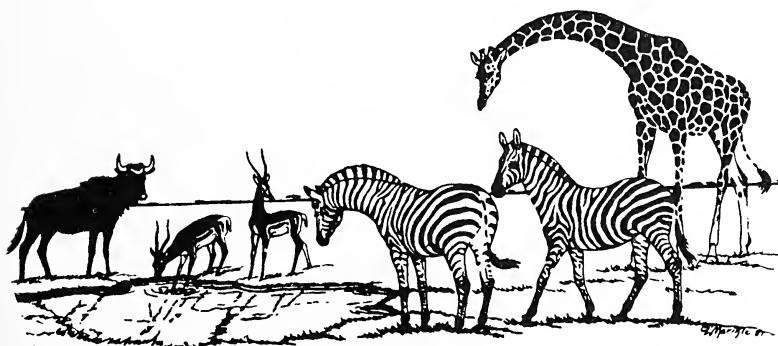
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The Collaboration of the Keeper and Veterinarian in the Chemical Restraint of Great Apes by Hand Syringe Injection

By

P.T. Robinson, M. S., D. V. M.
Jennings Center for Zoological Medicine
Zoological Society of San Diego
San Diego, CA

It is frequently possible for the experienced zoo veterinary clinician to deliver chemical restraint drugs to chimpanzees, orangutans and gorillas by hand injection through caging bars. The technique which is described below has been successfully used in great apes at the San Diego Zoo in dozens of cases. This method has advantages in preventing some potential injuries from the use of projectile darts and may reduce the excitement produced by such procedures.

The basic approach used for all chemical restraint procedures is to reduce the excitement factor to all degrees possible. While difficult to accomplish, personnel are encouraged to carry out their daily work in as normal a fashion as possible. Extraneous staff are deterred from interacting with patients. In most instances, the segregation from cohorts and restriction of food and water signals some wariness in the patient. This level of concern is readily heightened if extra employees, loud talking, and the loading and conspicuous assembly of equipment are permitted.

Ketamine HCl was the primary restraint agent used in all cases. Concentrations up to 200 mg/ml, using sterile water for injection for reconstitution of lyophilized product, were employed in the larger apes with no apparent problems at the injection sites. The perifemoral musculature was used most frequently as the target zone for the injection, although in larger individuals, the perihumeral muscle mass also was employed.

Some knowledge of the patients' potential reactions to novel stimuli is valuable. A great ape with previous experiences of this type may readily associate the current scenario with those of the past and become apprehensive. The cooperation of a keeper with whom the animal has gained trust has important counterbalancing effects.

The following techniques have been used successfully in many cases:

- 1 . Avoid undue attention to the patient by eye contact and bodily actions.
Appear to be on a mission unrelated to the individual in question.
2. Socialize with the keeper and with other apes in the vicinity, reserving your greeting to the patient and allowing time for the patient to adapt to your presence.
3. The position of your hands is frequently of interest to an ape in this circumstance.
Vary the visibility of both hands, holding one then the other, then both behind your back. Convince the individual that you are not concealing an object from its view.
4. If possible, establish physical contact with the patient. A knowledge of the patient's personality and the risk of this maneuver should be judged.
5. Since food has been withheld, some individuals may at this point express some interest in food objects; this interest may be stimulated by your peeling and eating a piece of fruit. Appear to have no intention of offering a morsel, rather wait for some evidence of interest.
6. At some point it is now necessary to prepare a syringe for hand injection. A useful method is to fashion a holster which may be inserted into a back pocket consisting of a plastic Monoject® - type syringe case. A luer-type syringe must be used and an 18 ga., 3.75 cm. needle is satisfactory. Use a syringe larger than necessary for ease of handling and to shorten the piston stroke required for injection. The needle cover is removed before the syringe is placed in the holster.

The Collaboration of the Keeper and Veterinarian in the Chemical Restraint of Great Apes by Hand Syringe Injection, Continued

7. When reapproaching the patient, prevent the syringe from being sighted. Reestablish the confidence that your hands are empty by the procedure described in item 3.
8. At this point the cooperation of a familiar keeper comes into play. The novelty of your presence is, hopefully, diminished and the interaction of the keeper at this time becomes a distraction from your presence.
9. The keeper may be able to encourage the patient into an injectable position either by interacting verbally or physically or with the use of a small morsel of fruit.
10. When the opportunity presents itself, there can be little hesitation to achieve a good I.M. injection. A continuous verbal dialogue with the keeper to position the patient is important. Position of the animal is important for a successful hand injection.
11. When the opportunity is close, it is essential to retrieve the loaded syringe from the holster and have it in hand; using the keeper or a cage divider as a temporary sight barrier for this move is often necessary.
12. Indicate to the keeper assisting you that your move is imminent; this will allow for any small positional adjustment on his part to remain out of reach of the patient, from interfering with your move, and to remain safe from the loaded syringe in hand.
13. Finally, it may be helpful in some cases to obstruct the vision of the patient by blocking with a hand the view between its eyes and the syringe hand, simultaneously with the injection itself.

In dozens of variations played out in this manner, no injuries of personnel have resulted. At the time of the injection, all attention seemed focused on the discomfort at the injection site rather than directed at the persons present. The animals have invariably been forgiving of the keeper for his part in the deception.

The procedure described will usually occupy no more than 10-15 minutes if it is to be successful.

® Monoject Syringe, Monoject DW of Sherwood Medical, St. Louis, MO 63103



Information Please

Help! I need any information or information sources regarding Black Kites (*Mulvis migrans*) also known as Common Kites and Pariah Kites. Also any information on brain damage due to emaciation in raptors. Personal experience on the latter would be great. Please contact Karen Brown at 4316 Guilford Ave., Livermore, CA 94550.

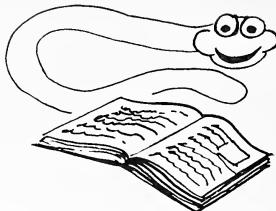
Due to the opening of our new elephant enclosure and plans to breed these magnificent animals, we would like to gain the assistance of other zoos which have both breeding and non-breeding herds of elephants, in the dietary needs of their elephants, as to what types of hay and supplements they receive and the amounts. This information would be gratefully appreciated. Please send to: Chief Supervisor, Taronga Zoo, P.O. Box 20, Mosman 2088, New South Wales, Australia.



Book Review

ARNIE the Darling Starling

By Margarete Sigm Corbo & Diane Marie Barras
Houghton Mifflin Co., 1983
2 Park St., Boston, MA 02108
231 pages Hardbound \$9.95



Review by Tom Aversa
AAZK Metro Boston Zoos
W. D. Stone Memorial Zoo
Stoneham, MA

Arnie the Darling Starling is a well-written account of a woman who takes a nestling starling into her home and forms a very strong bond of love with the bird. The story is always entertaining, sometimes heartwarming, and only occasionally does it get bogged down in anthropomorphic excesses. This is definitely a book to read if you like "cute animal stories", although it can be enjoyed by anyone who has ever owned a pet, or taken in a stray animal.

Arnie comes into Margarete Corbo's life when he falls out of his nest which is under the eaves of her home in Texas. After several unsuccessful attempts at replacing him in the nest, she decides to try to raise him. Margarete is certainly not the scientific type, but she manages with Arnie by using a combination of trial and error and homespun notions. Corn, steak and orange juice are the mainstays of this starling's diet. As an adult, the bird is so thoroughly imprinted, that he shows no inclination to return to the wild, so he is given status as one of the family, along with her three cats.

The story of Arnie is interesting in many ways. The most endearing trait of this starling was his ability to reproduce human speech. Many people do not realize that these birds are in the family of birds (*Sturnidae*) which includes some of the best "talkers" such as Myna birds. Arnie developed quite a vocabulary, and had a knack for linking words and phrases into meaningful statements. Margarete and Arnie touch many peoples' lives and undergo many experiences in this short book. A drug addict, a Vietnamese refugee, a pesticide-poisoned sparrow, and Margarete's own grandson are all brought into the story, and affected by Arnie, in one way or another. It does get a little carried away at times, but it still holds the reader's interest. Although Arnie the Darling Starling is certainly not a treatise on avian behavior, it is entertaining, and does provide some insight into human/animal interactions.



KEEPER'S ALERT

Felid Research and Conservation Interest Group

I would like to organize an interest group whose purpose would be to share information from conferences, symposia, and ongoing research among individuals interested in felid research and conservation. Additional activities could be the generation of felid and felid-related bibliography, a periodic literature update, the generation of a quarterly newsletter, and a directory of interested individuals. If you have a sincere interest in participating in such a group, please send a self-addressed, stamped envelope to: Gail E. Foreman, Department of Zoology, OSU, 1735 Neil Ave., Columbus, OH 43210.

Zoo Trivia Exchange Sought

Collector of Zoo Trivia - patches, postcards, guide books, decals and so on, in fact anything zoo-related - would be most interested to hear from others with similar interests, with a view to exchanging items, ideas or whatever. If interested, please drop a line to Phil King, Assiniboine Park Zoo, 2355 Corydon Ave., Winnipeg, Manitoba, Canada R3P 0R5.

CONFERENCE '87

MILWAUKEE, WI

October 4-8, 1987

Side Trip Information

Wednesday, 7 October, the delegates to the 1987 National Conference will take an exciting three-stop tour of Milwaukee. The featured stops will include the Milwaukee Public Museum, the Milwaukee Conservatory and the Miller Brewing Company.

There is no other museum like the Milwaukee Public Museum. As you literally travel through time or from continent to continent, you find yourself frequently "in" the exhibit. Visitors delight in this lively approach. No other museum offers as complete and fascinating a cultural, historical and environmental tour of the entire world from ancient times to the present. The imaginative "you are there" technique has gained the museum worldwide recognition. Discover the wonders of life--all forms of life and how they exist together on earth, culminating in an exhibit of man's relationship to his urban environment called "The Urban Habitat: The City and Beyond".

During this "journey" of sight and sound, meet people in the family of man; come nose to nose with a dinosaur, a running step ahead of stampeding bison, onto the deck of the "godspeed" on a journey to the new world, beneath the oceans and among a circle of Masaii on a lion hunt. We think you'll agree--there is no other museum like the Milwaukee Public Museum.

The only horticultural structure of its kind in the world, the Mitchell Park Conservatory was conceived and designed to let visitors experience nature from all regions of the world. You can experience a walk through the tropics, follow a winding trail through the desert regions, or enjoy the spectacular beauty of the seasonal snows. There are three domes -- tropical, arid and the famous snow dome. Each dome is almost half the length of a football field in diameter, nearly the height of a seven-story building, and can have the air changed completely in 3 1/2 minutes.

The final stop on our Milwaukee tour will be the Miller Brewing Company. The largest brewery in Milwaukee will feature a guided tour and a stop in the tasting room.

The cost of the Milwaukee day tour is included in the conference registration. We recommend you not leave Milwaukee without seeing these world famous institutions.

Cross-word Puzzle Clues

Across:

3. Site of pre-conference tour, _____ Crane Foundation.

7. Shedd _____. (See 9 Across)

9. The post-conference trip will feature the Brookfield and _____ Park zoos.

Down:

19. The side trip includes the museum, domes and a Milwaukee _____.

1987 AAZK NATIONAL CONFERENCE REGISTRATION FORM

OCTOBER 4-8, 1987

Milwaukee, WI

Please type or print. (One name per form)

Name _____

Address _____

City _____ State/Province _____

Zip Code _____ Telephone # (_____) _____

Zoo Affiliation _____

Area of Interest _____

AAZK Committee Member? _____

Will be submitting a paper: Yes No
(\$20.00 will be refunded from registration fee on acceptance of paper.)

Participating in Zoolympics: Yes No

Bringing auction item: Yes No Describe briefly _____

Vegetarian: Yes No (Specify Type _____)

Banquet Entree: (check one) Beef Chicken Vegetarian

Are you interested in a Conference T-shirt: Yes No (S M L XL)

AAZK Membership Status and Fees:

Member/Spouse	\$55.00 each
Non-Member	\$70.00 each
Late Fee	\$10.00 (after August 15, 1987)

Total Fees Enclosed \$ _____

One-day rates for individual conference events are available. Contact Steven M. Wing for details.

Arrival date and time: _____

Let us know ASAP if you need pick-up assistance.

Please make payment to: AAZK Milwaukee Chapter

Return this form with your fee to: Conference '87, Milwaukee County Zoo, 1001 W. Bluemound Road, Milwaukee, WI 53226.

HOTEL RESERVATION REQUEST

1987 AAZK National Conference

October 4-8, 1987



Name _____

Address _____

City _____ State/Province _____

Zip Code _____ Telephone # (_____) _____

Date of Arrival _____

Date of Departure _____

Guaranteed by: Credit Card Check

Credit Card _____

Card # _____ Expiration Date: _____

Rooms will be held only until 6:00 p.m. unless guaranteed by either credit card or one night's deposit.

	<u>Dbl./Dbl.</u>	<u>King</u>
1 Person _____	____ \$50.00	____ \$50.00
2 Persons _____	____ \$50.00	____ \$50.00

I will be sharing a room with _____

We will be able to match-up single delegates with roommates.

Do you need a roommate: Yes No If yes, state restrictions (i.e. male, female, nonsmoker, etc.) _____

We will make every effort to match roommates, but we cannot guarantee it.

Return this form to:

Conference '87
Milwaukee County Zoo
10001 W. Bluemound Road
Milwaukee, WI 53226

Guidelines for Typing Papers for AAZK Conference Proceedings

1. Manuscripts intended for publication should be submitted on one side of 8 1/2" x 11" paper. Pages should be neatly typewritten using a 70-space line. You will have narrow margins on Pica type and wider on Elite. This format makes it more convenient for the staff to figure number of characters per line/lines per page.
2. Papers must be double-spaced. This will also make it easier for you to read when you present it.
3. Titles should be brief and descriptive. Put the title of the paper on the first sheet as well as your name, title or classification, zoo identification, city and state. Number pages consecutively in the upper right-hand corner.
4. All graphs, charts and illustrations must fit within a 6" by 10" border. These must be in black and white only (no faded gray xerox copies, please) and should each be submitted on a separate sheet of paper and not run within the text.
5. Presenters are encouraged to submit photographs to accompany their text in the published proceedings. Photos must be black and white and should be clean, of good contrast and preferably on glossy stock. 5" x 7" works best for our purposes, but other sizes are acceptable. Be sure and give photographer's name if other than your own.
6. Please use the metric system for weights and measures (standard equivalents may be noted in parenthesis). Use the continental dating system (day-month-year). Times should be listed as per the 24-hour clock (0800, 1630 hrs., etc.).
7. Use both scientific and common name the first time a species is mentioned in the text. Thereafter the common name may be used.
8. Avoid footnotes. Identify Registered or Trademark products by ® or ™ respectively.
9. References should be listed alphabetically at the end of the paper - author's surname first (Ricter, J.W., 1984, How To Be A Good Keeper. AKF, Vol. 11, No. 6: 12-22) Within the text, references should be cited as Ricter (1984).
10. Manuscripts must be submitted before presentation.

(Editor's note: For further information on how to prepare and submit a paper for either a National Conference or for submitting for publication in Animal Keepers' Forum, please see "How To Write It Right!", January 1986 AKF, pages 23-26. Reprints of this article are available by writing the editor and enclosing a self-addressed, legal-sized, stamped envelope.)



Elephant Set



ONE SMALL STEP

By

Ron Ringer, Lead Elephant Keeper

Topeka Zoological Park, Topeka, KS

Chairman, Committee to Standardize Elephant Commands

Let's chalk one up for elephant keepers throughout North America. The critics said that we couldn't agree on anything except the fact that elephants have trunks. Well, two years ago in Fort Worth, we agreed on a list of basic elephant commands and during the past year of 1986 we implemented them.

At the Seventh Annual Elephant Workshop in Calgary, Canada, it was my pleasure to announce that of the 95 zoos and wild animal parks that exhibit elephants in the U.S. and Canada, 64 of them had confirmed that they will adopt the standard list of commands. After returning from the conference, I was able to add nine more institutions in North America. A special round of applause goes to our friends in Canada where they have 100% participation among their elephant exhibiting institutions. (One quick note - at the conference in Calgary, delegates voted to add one command to the list. The command is 'COME HERE'. This brings the basic list of commands to a total of eleven.)

Accompanying this article is a current list of the zoos and wild animal parks that have adopted the standard list of elephant commands. If your institution is not listed and you are planning to use the commands, please contact me as soon as possible. One of the last acts of our committee will be to turn over the list to the Asian Elephant SSP Committee for their use. Our committee has forwarded a proposal to the SSP board suggesting that the standard list of commands be used as one of the guidelines for participating institutions.

Over the past two years our committee has worked hard to try and enhance our ability to work together for the survival of both the Asian and African Elephant in North America. Standard commands are but a small step in the right direction, but a high hurdle in terms of cooperation between elephant people. Elephant handlers will never agree on every aspect of elephant management, which is good, but the fact that we can agree on certain things like basic commands is promising. The job that lies ahead is but an easy one - to continue to use these 11 commands from now on and to teach them to the next generation of elephant keepers.

With the committee's work coming to a close, I would like to take this opportunity to thank committee members Jean Hromadka, elephant keeper at the San Diego Wild Animal Park, and Tim Stout, elephant handler for Jo-Don Farms of Franksville, WI for their help on this project. Also thanks to Smokey Jones and Don Meyer with whom I have consulted and who have offered their guidance. Lastly, a special thanks to all the elephant people who have sent me their thoughts and suggestions and, of course, for adopting the list of basic elephant commands.

A List of Zoos Using Standard Elephant Commands

1. Canadian Zoological Systems, Ltd., Cambridge, Ontario, Canada
2. Calgary Zoo, Calgary, Alberta, Canada
3. Valley Zoo, Edmonton, Alberta, Canada
4. Vancouver Public Aquarium, Vancouver, British Columbia, Canada
5. Metro Toronto Zoo, Toronto, Ontario, Canada
6. Granby Zoological Park, Granby, Quebec, Canada

ELEPHANT SET, *Continued*

7. Little Rock Zoological Park, Little Rock, AR
8. Phoenix Zoo, Phoenix, AZ
9. Reid Park Zoo, Tucson, AZ
10. The Fresno Zoo, Fresno, CA
11. Los Angeles Zoo, Los Angeles, CA
12. Sacramento Zoo, Sacramento, CA
13. San Diego Wild Animal Park, Escondido, CA
14. San Diego Zoo, San Diego, CA
15. San Francisco Zoological Gardens, San Francisco, CA
16. Santa Barbara Zoo, Santa Barbara, CA
17. Marine World/Africa USA, Vallejo, CA
18. Denver Zoological Park, Denver, CO
19. National Zoological Park, Washington, DC
20. Jacksonville Zoo, Jacksonville, FL
21. Central Florida Zoological Park, Lake Monroe, FL
22. Busch Gardens, Tampa, FL
23. Zoo Atlanta, Atlanta, GA
24. Honolulu Zoo, Honolulu, HI
25. Chicago Zoological Park, Brookfield, IL
26. Lincoln Park Zoo, Chicago, IL
27. Indianapolis Zoo, Indianapolis, IN
28. Lee Richardson Zoo, Garden City, KS
29. Topeka Zoological Park, Topeka, KS
30. Sedgwick County Zoo, Wichita, KS
31. Ralph Mitchell Zoo, Independence, KS
32. Greater Baton Rouge Zoo, Baton Rouge, LA
33. Audubon Park Zoo, New Orleans, LA
34. Baltimore Zoo, Baltimore, MD
35. Buttonwood Zoo, New Bedford, MA
36. Potter Park Zoo, Lansing, MI
37. Jackson Zoological Park, Jackson, MS
38. Kansas City Zoological Park, Kansas City, MO
39. St. Louis Zoo, St. Louis, MO
40. Dickerson Park Zoo, Springfield, MO
41. Henry Doorly Zoo, Omaha, NE
42. Rio Grande Zoological Park, Albuquerque, NM
43. Buffalo Zoological Park, Buffalo, NY
44. New York Zoological Park, Bronx, NY
45. Seneca Park Zoo, Rochester, NY
46. Burnet Park Zoo, Syracuse, NY
47. North Carolina Zoological Park, Asheboro, NC
48. Toledo Zoological Park, Toledo, OH
49. Oklahoma City Zoo, Oklahoma City, OK
50. Tulsa Zoological Park, Tulsa, OK
51. Washington Park Zoo, Portland, OR
52. Wildlife Safari, Winston, OR
53. Erie Zoological Park, Erie, PA
54. Pittsburgh Zoo, Pittsburgh, PA
55. Knoxville Zoo, Knoxville, TN
56. Abilene Zoological Park, Abilene, TX
57. Gladys Porter Zoo, Brownsville, TX
58. Dallas Zoo, Dallas, TX
59. Ft. Worth Zoo, Ft. Worth, TX
60. El Paso Zoological Park, El Paso, TX
61. Houston Zoological Gardens, Houston, TX
62. Caldwell Zoo, Tyler, TX
63. Central Texas Zoo, Waco, TX
64. Woodland Park Zoological Gardens, Seattle, WA

ELEPHANT SET, Continued

65. Milwaukee County Zoo, Milwaukee, WI
66. Racine Zoo, Racine, WI
67. Kings Dominion Zoo, Doswell, VA
68. San Antonio Zoo, San Antonio, TX
69. Hogle Zoo, Salt Lake City, UT
70. Memphis Zoo, Memphis, TN
71. Philadelphia Zoological Park, Philadelphia, PA
72. Cincinnati Zoo, Cincinnati, OH
73. The Alaska Zoo, Anchorage, AK

(Editor's note: Those interested in this program or who wish more information may write to Ron Ringer c/o Topeka Zoological Park, 635 Gage Blvd., Topeka, KS 66606.)



Wildlife Survival Update

U.S. Developing Positions On Changes To Endangered Species Convention

Ninety-six member nations will convene in Canada in July to review the effectiveness of international regulation of world commerce in wildlife as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) begins its sixth biennial conference. The conference will be held 12-24 July in Ottawa, Ontario, Canada.

The United States organized the global program to control the burgeoning trade in endangered wildlife and plants in 1974. The Interior Department's U.S. Fish and Wildlife Service, which enforces the CITES agreement within the U.S., plans to announce tentative negotiating positions on this session's issues by early April and will hold a public meeting on these positions around 23 April in Washington, DC. Final U.S. positions will be announced on or about 22 June, 1987.

According to USFW Service Director Frank Dunkle, "Nations from around the world will be represented in Ottawa seeking to improve the ways in which wildlife and plants are regulated in international trade. As the United States has shown by nearly 14 years of commitment to the CITES agreement, we take our responsibility to the world's wildlife seriously. We expect no less from the other CITES member countries."

CITES seeks to regulate the trade in hundreds of species of animals and plants by establishing management and scientific authorities in every member nation and requiring that documentation accompany international shipments of designated species or of products made from them. Such documents cannot be issued unless a scientific authority first determines that trade would not be detrimental to the survival of the species. The agreement complements U.S. laws such as the Endangered Species Act and the Lacey Act, that also regulates trade in endangered species and other wildlife.

CITES establishes three classifications of species it protects. Protected species are listed in appendices to the treaty: Appendix I contains animals and plants in greatest danger of extinction, such as the mountain gorilla, certain sea turtles, and the cheetah, whose trade is severely restricted; Appendix II identifies species not presently facing extinction, such as the African elephant and the osprey, but which could become so if trade is not carefully monitored and regulated; and Appendix III contains species that may not be threatened at all but for which certain nations have requested international assistance in controlling trade, such as Canada's walrus and Nepal's water buffalo.

Wildlife Survival Update, Continued

Although specific changes in the CITES appendices have not yet been proposed for the Ottawa meeting, several issues have been identified and will be considered at the July session:

- ◆ A recommendation to continue a ban of all trade in CITES-controlled species with Bolivia and to impose a ban on trade with Paraguay because of the continuing problems of illegal trade in protected species from these South American nations;
- ◆ Consideration of changes in the control of trade in African elephant ivory and disposition of stockpiled illegal ivory in certain African countries;
- ◆ Discussion of the continuing illegal trade in rhinoceros horn from North Yemen despite a CITES-wide ban and assurances from other nations importing rhino horn that they will soon end their trade. Trade in this highly endangered species was the subject of recent U.S. Congressional hearings;
- ◆ A review of the world trade in leopard skins allowed from seven African countries and sold as personal items under quota. Although the U.S. does not allow imports of such personal items, it does allow imports of sport-hunted leopard trophies from certain sub-Saharan nations when it finds that it enhances the survival of the species.

A complete summary of the provisional agenda of the sixth regular meeting of CITES appears in the January 13, 1987 Federal Register.



CHAPTER NEWS

East Bay/Oakland Zoo Chapter

We're off and running! The East Bay Chapter of the AAZK was established on 10 May, 1986 with the ratification of our by-laws and installation of our officers:

President.....Alan P. Varsik
VP/Treasurer.....Bill Garrison
Secretary.....Karen Brown

Our Chapter was established to directly benefit the Knowland Park/Oakland Zoo. We produced the Oakland Zoo 50th Anniversary Print whose revenues enabled us to purchase an airless paint sprayer and six "DO NOT FEED" signs. The remaining funds are slotted for future projects. We have sponsored a lecture on animal health care and a painting party for the Children's Zoo. We are looking forward to many more projects to benefit both the Knowland Park/Oakland Zoo and keeper education at our zoo and other zoos as well. -Karen Brown, Sec'y

Greenville Zoo AAZK Chapter

National AAZK would like to welcome its newest Chapter at the Greenville Zoo in Greenville, SC. Officers for the Chapter are:

President.....Karen Stern
Vice Pres.....Janie Raxter
Secretary.....Victoria Pitts
Treasurer.....Robert Curl
Chapter Liaison.....Jami Steele
Program Coordinators:
Janie Raxter & Jami Steele

High Plains Chapter

Officers for the High Plains AAZK Chapter, located at the Lee Richardson Zoo, Garden City, KS are:

President.....Jenifer Hanneman
Sec/Treas.....Tina Zerr

This Chapter hosted the fall KAZOO meeting at their facility. For those not familiar with the term - KAZOO is the association of Kansas Zoos. Chapter members are currently working on Christmas magnets to sell as a fund-raiser. They provided the funds to build and erect two display cases. This was a joint project with the zoo's docents with

CHAPTER NEWS

Continued

each group having a case to display their desired subject. Our Chapter is preparing the first display to explain AAZK and its purpose.

AAZK Honolulu Chapter

We were busy late last year increasing our membership and our bank account. In October, we held a pizza & beer bash to stimulate active participation in our chapter.

We are very excited about our recent fundraising project. Jeff Devine came up with an Iwi, one of Hawaii's native forest birds, design which we've used for patches (\$2) and T-shirts (\$8); the Iwi is a bold red on black background.

In August, our significant-other chapter was formed at the Panaewa Rainforest Zoo in Hilo (on the "Big Island" of Hawaii).

At our February meeting we held elections. New officers for 1987 are:

President.....Dan Vitiello
Vice Pres.....Linda Elliot
Sec/Treas.....Brent Liesemeyer

We hold our meetings on the first Tuesday of the month. We're looking forward to promoting professional animal care in 1987.

---Alice P.S. Roberts

Zoo Atlanta AAZK Chapter

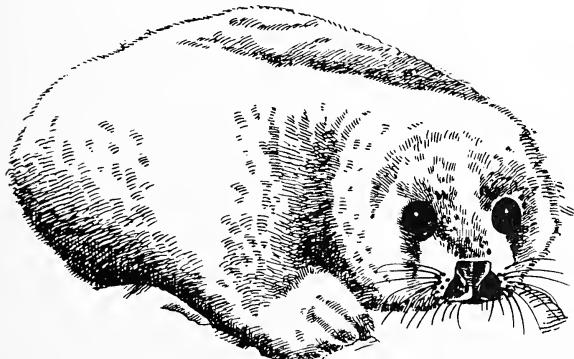
The Zoo Atlanta Chapter recently completed the renovation of a unit in the primate building to a new naturalistic exhibit for golden lion tamarins. This project was funded and built by our AAZK keepers. Visiting primatologist Russel Mittmeier and ethnobotanist Mark Plotkin were impressed with our results.

Chapter members are busy working on a slide presentation to be used on career day events at schools. We are also in the process of designing a new chapter logo.

The \$25 million renovation of Zoo Atlanta is progressing well. The new flamingo plaza entry, gibbon & hornbill exhibits will open this summer. The African and Asian rainforests, African Savanna and Mzima Springs will open in summer of 1988.

Interested individuals are reminded that the Zoo Atlanta Chapter is still selling two unique T-shirts. One features our 3-year-old African elephants footprint and sells for \$8.00. The other is a commemorative T-shirt featuring "Willie B.", the Zoo's male lowland gorilla who recently celebrated his 25th anniversary. This shirt sells for \$5.00. You may order either shirt by sending the necessary size information and check payable to "Zoo Atlanta AAZK Chapter" to: AAZK Treasurer, 800 Cherokee Ave. S.E., Atlanta, GA 30315.

-Tim Kurkowski, *Chapter Liaison*



A First - East of the Mississippi

By
Rick Passaro, Zoology Curator
Virginia Living Museum
Newport News, VA

The Peninsula Nature and Science Center is currently undergoing a massive renovation project which is slated to be completed this spring. The new facility will emerge as an entirely different entity, The Virginia Living Museum.

The wheels for the project were set in motion in 1983 when a five-year master plan was developed. It was decided then to carry the museum into a new and innovative direction. Thus the concept of a 'living museum' was adopted.

Tucked neatly on over 24 acres, adjacent Deer Park Lake is the heart of the City of Newport News. The Peninsula Nature and Science Center has served as an educational and recreational science-oriented facility for over twenty years. In 1965 the Center was founded as the Peninsula Junior Nature Museum and Planetarium. To avoid misconceptions that the museum was only for children, the name was changed in 1974.

Until recently, the museum was broken up into several sections. The exhibit areas consisted of astronomy and natural history displays; in 1981, "Curiosity Corner" was constructed. It was designed to give visitors an introduction to the physical sciences and technology, while utilizing direct hands-on and activity-oriented exhibits. The remaining public areas consisted of a planetarium, nature trails and an aquarium in which native fresh and saltwater aquatic species were depicted in naturalistic environments.

The new plan for the Virginia Living Museum project is to incorporate different aspects of natural history museums, botanical/zoo logical parks, aquariums, nature centers, planetariums and science centers. To accomplish this, many varieties of exhibit philosophies will be utilized with an emphasis on living displays. In addition, all exhibits both living and non-living will center around the past, present, or future history of Virginia. As a result all of the living species to be exhibited are currently extant within the Commonwealth of Virginia.

Exhibit areas within the Museum will feature an extensive "How Life Survives" section which will be further divided into "Shelter and Living Space", "Getting Food", "Reproduction", and "Defense". The specimens chosen for these displays will represent a particular function of survival in the wild.

Another major indoor exhibit, "The James River from the Mountains to the Sea", is actually composed of five different enclosures, each depicting characteristic changes in topography, flora and fauna as the river winds its way to the Chesapeake Bay. Other indoor exhibitry will include a Dismal Swamp display, a "World of Darkness" and a two-story glass enclosed walk-through aviary. All of these exhibits will house plants, invertebrates, fish, herptiles, birds or mammals which are native to Virginia. Many will contain a diversity of mixed species.

Outdoors, a boardwalk is being constructed along the edge of Deer Park Lake. Along the way visitors will be treated to natural habitat enclosures featuring the likes of raccoons, beavers, otters, bobcats, bald eagles, striped skunks, opossums, white-tailed deer, wild turkeys, red and gray foxes. Additionally, waterfowl nesting islands are being constructed and turtle logs are being secured for visitors to see, close-up, some of our naturally occurring fauna.

The Museum will continue and expand its commitment to education through its programs both on and off site. Conservation will also be highlighted as the Museum continues its work as a wildlife rehabilitation center.

When completed, the Virginia Living Museum will become the first of its kind on the east coast. Please feel free to contact us if you would like to know more about the project. Better still, there is a lot to do here, so a summer trip would certainly be in order. We look forward to seeing you!



AAZK Regional Coordinators

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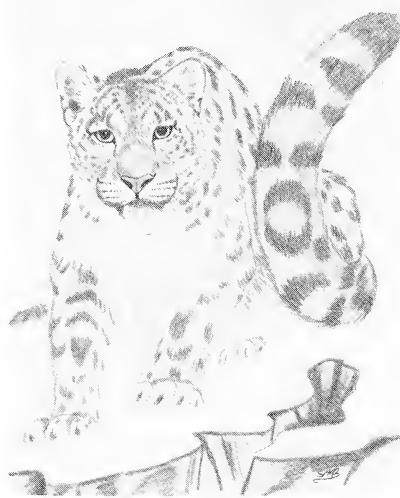
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Need membership information? Want to learn about AAZK or start a chapter or become more active - then call your RC! There are still openings for RC positions for (1) the states of TN, NC, SC, W. VA; and (2) the states of MI, IN, KY and OH. If you are interested, please contact Diane Krug, Eastern U.S. Regional Co-Director. You may call Diane collect at her home phone (904) 845-4279 evenings after 6 p.m. EST. These two positions offer a great opportunity to become involved in AAZK and to provide a valuable and necessary service to your Association.



Biological Values II Now Available . . .



AAZK is pleased to offer its members and other interested individuals in the zoo community the mammal reference book entitled *Biological Values For Selected Mammals* - - 1985 Edition. This updated and expanded edition is far more comprehensive than the original edition. The 1985 Edition is a 112-page work containing biological data on 441 species of mammals. Included in the data are: common name, scientific name (identified by genus and species and arranged according to the 19 recognized orders of mammals), geographic range, normal adult size, normal adult weight, estrus cycle, gestation period, number of young, weaning, sexual maturity, life expectancy, body temperature, pulse and respiration rate, and names used for the male, female and young of each species. Three pages of the references for data given are included, as is a nine-page index of the selected mammals by common name with cross-indexing when considered appropriate. A Table of Contents offers the researcher quick access to pertinent information.

This handy and informative publication was researched and compiled by a team of seventeen zookeepers, docents, interns and zoo volunteers at the San Francisco Zoo, and separately identifies and incorporates certain pertinent empirical data submitted by twenty zookeepers from twelve zoos throughout the world. Formated for quick and easy reference, and charmingly illustrated, this book will surely be an important and welcome addition to the library of any zookeeper and/or member of the zoo community.

Biological Values For Selected Mammals is being offered for sale at the following prices: Professional AAZK Member (\$4.00); Other AAZK Membership Categories (\$5.50); Non-Members (\$7.00). This price includes postage and handling. Orders outside the U.S. (including Canada) need to add \$2.00 per copy for First Class mail service. Domestic orders are sent Book Rate. To order, fill out the form below or send necessary information to: *Biological Values Book*, c/o AAZK National Headquarters, 635 Gage Blvd., Topeka, KS 66606. Make check or money order (U.S. Funds Only) payable to: "Biological Values/AAZK". Domestic orders please allow 4-6 weeks delivery at Book Rate.

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Artificial Insemination in Birds: A Basic Methodology for the Modern Bird Keeper

By

Kevin T. Patton, Chairman

Department of Biology

St. Mary's College, O'Fallon, MO

Introduction

More and more, captive wild animal keepers are told that they have taken Noah's place as saviors of endangered species. They are given a charge to maintain viable populations of animals in 'the ark' until they can be reintroduced into their native habitat. Although it may seem that 'the flood' of pollution and habitat destruction may never cease, like Noah, the animal keeper must still hope.

Fortunately, for some avian species the 'deluge' is now only a memory. For example, the Barn Owl (*Strix varia*) has recently been reintroduced into parts of the midwestern United States after many years of virtual absence. The Whooping Crane (*Grus americana*) is a now famous example of the drama of a successful ongoing return from the brink of extinction. These successes provide the inspiration necessary to continue our programs for captive propagation.

As wild animal keepers proceed with this charge of maintaining captive breeding populations of endangered species, they are often impeded by the behavioral or physiological inability of some individuals to breed successfully. Captive animal biologists continue to work on these problems, and have produced some results which have significantly improved the ability of the wild animal keeper to induce and/or enhance propagation of many species. Among these tools are such things as genetic management, naturalized design of breeding compounds, nutritional supplements, hormone therapies, and many others. One that has received quite a bit of attention over the years is artificial insemination.

The first modern scientist to try artificial insemination was probably Lazarro Spallanzani, who tried it on domestic dogs in the 18th century. However, since that time the art has progressed to a point that it is a matter of a very simple procedure for many species, including most birds. By mastering a handful of basic principles, and practicing a rather simple procedure requiring no extraordinary instruments, the average bird keeper can learn to use artificial insemination in his/her collection when the need arises.

Basic Principles

As we study the adaptations that each of the world's species has made to fit into its unique ecological niche, we are led to the conclusion that the major consideration is survival of the species. Sexual reproduction has proven to be a highly successful strategy to achieve that end. Gamete cells from each parent contain half the amount of genetic material, in the form of chromosomes for each offspring. At conception, a gamete from each parent fuses to form the first cell of the new organism. Thus, the offspring has genetic material from two preceding organisms and, therefore, has the potential for being even more successful than they in surviving.

To achieve sexual conception, the male gamete [spermatoza] must be deposited in the female reproductive tract where it can swim toward the female gamete [ovum, or egg]. This process is termed insemination. A complex series of courtship behaviors, bonding, and then copulation is the natural situation in which conception of new offspring occurs. Because this situation may not occur in captive birds, one must sometimes resort to artificial methods of insemination, or the species will not continue to survive. Copulation, or insemination, in birds follows the typical vertebrate pattern:

I. Courtship - mostly behavioral interaction between potential mates for the purpose of selecting a 'good match' of chromosomes to be paired, enhancing the likelihood of species survival.

ARTIFICIAL INSEMINATION IN BIRDS: A Basic Methodology for the Modern Bird Keeper, Continued

2. Physiological readiness - female reproductive tract makes itself ready for reception of sperm by everting slightly at the end of the tract. The male's system readies itself by contracting the sperm and seminal fluid storage organ and perhaps eversion of a penile organ.

3. Copulation - the male typically mounts the female from behind, the female bending slightly so that the cloaca of each may come into closest possible position. During copulation, semen [spermatozoa mixed with seminal fluid] is ejaculated into the female's reproductive tract.

Procedures and Discussion

Artificial methods of insemination are many. Over the years, workers in this field have tried dozens, perhaps hundreds, of variations in technique. Outlined here are the simplest, most reliable methods I have found for insemination of birds. It is the responsibility of each practitioner to compare and contrast all proven methods to see which is best for each application.

The first step in artificial insemination is making sure that parent birds are available and are, in fact, producing viable gametes. The birds must be sexually mature and in good general health; and, of course, the breeding season of the species must be considered. A veterinarian with experience in this area may be of some assistance in determining the potential of particular candidates.

The best method, on all counts, utilizes parents that are imprinted on humans or on an inanimate object. If raised by hand, it is fairly easy to imprint a bird for such purposes. An imprinted male will often 'copulate' with a glove, a hat, or a human hand, leaving a copious supply of high-quality semen. Similarly, a female that is imprinted will often present herself to her human 'mate' upon the proper behavioral cues (such as helping her build a nest) and evert the oviduct for deposition of sperm.

As mentioned, proper behavioral conditioning [imitation of courtship behaviors important to the particular species] is often necessary for either male or female receptivity.

If imprinted females are not available, the oviduct may be everted artificially via a method roughly following that outlined for domestic fowl by Quinn and Burrows (in various works--see reading list):

1. The female is held with the sternum resting in the left palm.
2. The bird is tilted with the caudal end point slightly upward. [This is best done while sitting, so as to utilize support offered by the lap of the keeper.]
3. With the thumb and forefinger of the right hand, apply pressure to the abdomen just to the rear of the cloaca, while at the same time applying pressure to the abdomen in front of the cloaca with the thumb and forefinger of the left hand.
4. The oviduct [and perhaps the anus] will present itself. Practice and careful manipulation [especially with the right fingers] may achieve eversion of only the oviduct, and with great speed.

Similarly, if semen collection must be done artificially, methods do exist that the typical keeper can learn to perform without the use of special equipment. One such method is the 'massage' method:

1. A suitable male is held in the left hand as indicated for the female [#1 and #2 above].
2. Using the right thumb and forefinger, exert pressure on the dorsum as you move along each side of the vertebral column toward the cloacal vent.
3. Repeat this procedure several times until eversion of the cloaca and emission of semen results.

[Note that many workers in this field feel that prior conditioning of a bird for this technique is necessary before success will be achieved.]

ARTIFICIAL INSEMINATION IN BIRDS: A Basic Methodology for the Modern Bird Keeper, *Continued*

The use of imprinted birds, if available, is the better choice for several reasons:

1. Stress minimized - the level of stress encountered in the handling routines described is very high, which may reduce subsequent fertility levels, whereas this is avoided when using imprinted birds.
2. Quality of semen - the volume and quality of the sperm in the semen seems to be much higher when deposited during 'copulation' by an imprinted bird than with the massage method.
3. Acceptance of semen - the natural autonomically controlled contractions of the female reproductive tract during normal copulation may occur when depositing semen with an imprinted female. This increases the likelihood that a significant number of sperm will reach the ova present further up the tract.

Whether using imprinted or nonimprinted birds, the semen must be collected from the male by the keeper, then deposited in the reproductive tract of the female. Despite the sheaves of papers on diluents, dilution ratios, semen freezing, and storage techniques, these topics are extraneous to the basic procedure. Unless you plan to store the semen collected or ship it a long distance, these other methodologies are useless to you. This is not to say that you should not consider the advantages to storing semen for later use, or arranging for semen donations to or from other collections. I simply mean that such procedures are not the core of the process and one can successfully proceed with artificial insemination without them.

The method that I recommend for collection and deposition of semen is as follows:

- I. Upon emission of semen from the male, it should be collected in a 100 unit [lcc] or larger syringe with the needle removed.
2. As soon as possible [the sooner, the better], the syringe is placed into the reproductive tract of the ready female as far as it will go easily. Hopefully, muscular contraction will actually pull the syringe along.
3. The semen is then slowly ejected into the female tract.
4. The syringe is carefully withdrawn. If done properly, there will be little if any semen on the outside of the cloaca.

Alternate methods employ capillary tubes (micropipettes) or other collection devices. As with any general scheme, allowances must be made for the size and type of bird being used. These allowances would dictate what changes be made in any other procedures so far listed. For instance, attempting to hold an ostrich in the manner described would be ridiculous, as would use of a large syringe with a tiny hummingbird.

Conclusion

A generally useful technique available to the typical bird keeper for artificial insemination can be summarized as follows:

- I. Collect semen from a male bird via 'copulation' by an imprinted bird or massage - stripping of semen by hand.
2. Semen collection may be done with a small needleless syringe, micropipette, or other instrument as appropriate.
3. Opening of female reproductive tract is everted during presentation by an imprinted female or by finger pressure.

ARTIFICIAL INSEMINATION IN BIRDS; A Basic Methodology for the Modern Bird Keeper, *Continued*

4. Undiluted semen is placed in female reproductive tract via insertion and emptying of the collection tube.

5. Collection tube is withdrawn carefully.

As with any new procedure, success may come only with adequate preparation and practice. However, considering the importance of preserving reproductively secure populations for the future, it is worth the time and the effort for the professional animal keeper to learn the skills necessary for artificial insemination.

Suggestions for Further Reading

Anonymous. 1980. Extinction or survival; semen preservation and artificial insemination could make the difference. *Endangered Species Technical Bulletin* 5:4-7. [This excellent 'special report' is a fine introduction to the field.]

Berry, R.B. 1972. Reproduction by artificial insemination in captive American goshawks. *Journal of Wildlife Management* 36:1283-1288. [Good general report on artificial insemination in this species.]

Burrows, W.H. and J. P. Quinn. 1935. A new method of obtaining spermatoza from the domestic fowl. *Poultry Science* 14:251-253. [Excellent brief report outlining practical methodology.]

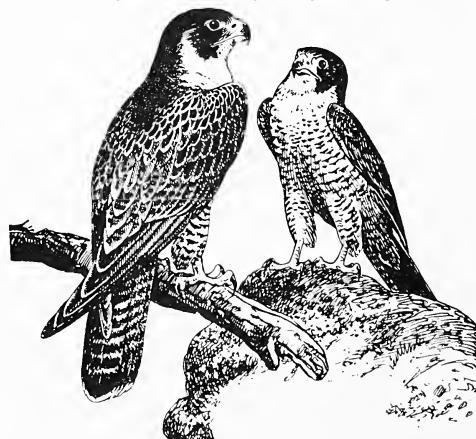
Crawford, W.C. 1984. The theory of imprinting--its implications and ramifications in raptors. *Wildlife Rehabilitation* 3:89-92. [Although title specifies raptors, this is a good article explaining the relationship of imprinting and artificial insemination.]

Lorenz, K. 1935. Companions as factors in the bird's environment. *Ornithol.* 83:137-213. 289-413. [Milestone paper on imprinting in birds, both natural and controlled.]

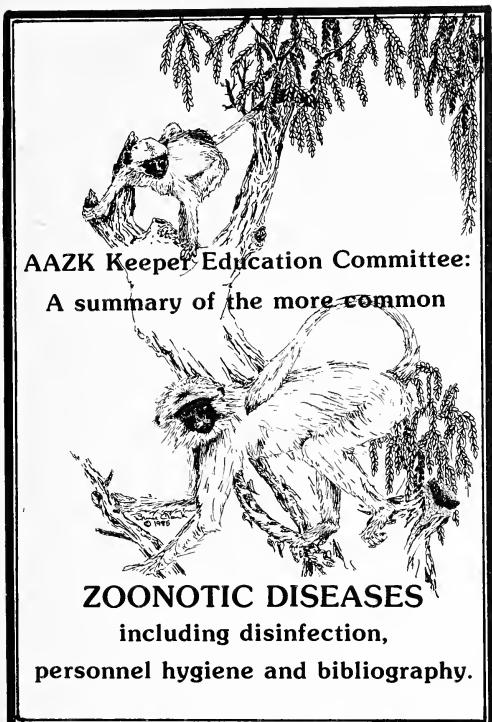
Quinn, J. P. and W. H. Burrows. 1936. Artificial insemination in fowls. *Journal of Heredity* 27:31-36. [This is a good summary of oviduct eversion in domestic fowl, as well as a fair discussion of general principles of artificial insemination.]

Temple, S. A. 1972. Artificial insemination with imprinted bird of prey. *Nature* 237:287-288. [Good general discussion and explanation of the use of imprinted males and females.]

Weaver, J. D. 1983. Artificial Insemination. In *FALCON PROPAGATION*, J. D. Weaver and T. J. Cade (ed.). Peregrine Fund, Ithaca, NY. [This is a chapter from an excellent avian propagation pamphlet. Section on massage method is especially useful.]



Announcing. . . .



AAZK is pleased to announce the availability of the publication entitled **ZOONOTIC DISEASES**. This 56-page booklet details the most common zoonotic diseases, offers guidelines for preventive control and covers personal hygiene and disinfection procedures.

The booklet, a cooperative effort produced by the AAZK Education Committee, is produced in an 8 1/2" by 11" format, hole-punched for insertion in a standard three-ring binder (not included).

Copies may be purchased by completing the order form below. Prices are: \$2.00 for Professional AAZK Members; \$3.50 for other AAZK membership categories; and \$5.00 for non-members. This price includes both postage and handling. Order from: Zoonotic Diseases, c/o AAZK National Headquarters, 635 Gage Blvd., Topeka, KS 66606. Make check payable to "AAZK".

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Institutions wishing to advertise employment opportunities are asked to send pertinent data by the 15th of each month to: Opportunity Knocks/AKF, 635 Gage Blvd., Topeka, KS 66606. Please include closing dates for positions available. There is no charge for this service and phone-in listings of positions which become available close to deadline are accepted.

ZOOKEEPER....at Santa Barbara Zoo. Salary \$12,480 plus benefits. Graduation from an accredited 2 year or 4 year college in animal science or related field preferred; at least one year paid experience in the care and handling of non-pet animals; zookeeping experience in an accredited zoological institution highly preferred. Send resume and reference by 10 April 1987 to: Susan Engefer, Assistant Director, Santa Barbara Zoo, 500 Ninos Dr., Santa Barbara, CA 93103.

ANIMAL KEEPER/BIRD DEPARTMENT....At the Baltimore Zoo. Salary \$13,314. Each candidate must have graduated from an accredited high school and have one year paid experience in the care and handling of a variety of birds, excluding pets; or have graduated from an accredited high school and have 6 months' experience in the care and handling of animals in a zoological institution; or have a bachelor's degree from an accredited college or university in biology, zoology, animal science or veterinary technology. Eligibility for a driver's license is required. This is an entry level position under the direct supervision of a Senior Keeper and/or Curator. All resumes to be sent to Frederick Beall, Curator of Birds, Baltimore Zoo, Druid Hill Park, Baltimore, MD 21217. Deadline for acceptance of applications is 1 May 1987.

WILDLIFE REHABILITATION INTERNSHIPSAt Lifeline for Wildlife, Inc., Stony Point, NY. Nationally recognized facility on 34 acres cares for 4000 wild mammals, birds and reptiles annually. Responsibilities: diverse depending on individual preference, i.e. wildlife care, veterinary assistance, construction, administrative/PR, education. Must work at least one month, preferably more. Housing provided; 60-hour work week. Exciting, compassionate animal rights community providing 24-hour medical/rescue care. No academic requirements but all applicants must be energetic, hard working, dedicated and compassionate. Please contact: Betsy Lewis, Lifeline for Wildlife, Inc., Blanchard Rd., Stony Point, NY 10980; (914) 429-0180.

KEEPERS....requires 2-3 years' experience with mammals and/or birds. Degree in biology or related science desirable. Salary approximately \$20,000 plus benefits.

ELEPHANT KEEPER....requires ability and experience (3-5 years) in the handling and training of African and Asian elephants. Also responsible for care and breeding of Indian rhino and Malayan tapirs. Salary approximately \$20,000 plus benefits.

For either of the above two positions, send letter detailing experience and career goals along with three (3) letters of recommendation to: Anna Marie O'Mara, Personnel Department, Philadelphia Zoological Garden, 34th St. & Girard Ave., Philadelphia, PA 19104 by 1 May 1987.

TRAVELING ZOO INSTRUCTOR....to work under the direction of the Staten Island Zoo's Education Dept. staff in planning, scheduling, conducting and evaluating off-site zoo education programs for school classes and other groups. Qualifications include ability to relate to and teach elementary school children using live animals. Must be experienced driver with a good driving record. Full-time internship for 35 hour week at \$9.00/hour (\$315.00 a week) plus social security, mid-September 1987 thru mid-June 1988. Job specifications: prepare and teach lessons primarily to lower elementary school children on principles of animal life, emphasizing positive attitudes, humane treatment, and conservation; schedule programs with schools by phone and mail; keep program records; be responsible for the safe and comfortable transportation and demonstration of animals used in programs; participate in other specified programs sponsored by the Zoo's Education Department; assist, as needed, in the care of the Ed. Dept.'s animal collection. Qualifications: must possess skills for confident handling of a variety of live animals, including ferrets, rabbits, chickens, and non-venomous snakes; demonstrated ability to plan and conduct lessons in animal and environmental education; must possess appropriate skills for teaching and managing lower elementary school children in a classroom setting. Send resume to: Bob Szita, Traveling Zoo Coordinator, Staten Island Zoo, 614 Broadway, Staten Island, NY 10310 (718) 442-3174.

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Membership includes a subscription to Animal Keepers' Forum. The membership card is good for free admission to many zoos and aquariums in the U.S. and Canada.

INFORMATION FOR CONTRIBUTORS

Animal Keepers' Forum publishes original papers and news items of interest to the Animal Keeping profession. Non-members are welcome to submit articles for consideration.

Articles should be typed or hand-printed. All illustrations, graphs and tables should be clearly marked, in final form, and should fit in a page size no more than 6" x 10" (15cm x 25 1/2cm). Literature used should be cited in the text and in final bibliography. Avoid footnotes. Include scientific name of species the first time it is used. Thereafter use common name. Black and white photos only accepted.

Articles sent to Animal Keepers' Forum will be reviewed for publication. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Those longer than three pages may be separated into monthly installments at the discretion of the editorial staff. The editors reserve the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope. Telephone contributions on late-breaking news or last-minute insertions are accepted. However, phone-in contributions of long articles will not be accepted. The phone number is (913) 272-5821 Ext. 31.

DEADLINE FOR EACH EDITION IS THE 15TH OF THE PRECEDING MONTH

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May 1987

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Executive Editor: Alice Miser
Managing Editor: Susan Chan
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May 1987
Volume Fourteen
Number Five

Animal Keepers' Forum (ISSN 0164-9531) is a monthly journal of the American Association of Zoo Keepers, Inc., 635 Gage Blvd., Topeka, KS 66606. Five dollars of each membership fee goes toward annual publication costs of Animal Keepers' Forum. Second Class postage paid at Topeka, KS. Postmaster: Please send address changes to:

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This month's cover art is by Elayne Barclay, a keeper at Washington Park Zoo, Portland, OR. Elayne's artwork features the Great Blue Heron (*Ardea herodias*). These wary and powerful birds often reach a height of 4 ft. with a wingspan of 6 ft. Though bulky, they can float like a goose and take off from the surface of the water. They nest in colonies, usually in tall trees and can be found in both fresh water and salt marsh habitats. Thanks, Elayne!

SCOOPS AND SCUTTLEBUTT

Call for 1987 AAZPA Conference Posters

The 1987 Annual Conference in Portland, OR will once again feature poster sessions by members. Poster papers are invited in all zoo fields and will be grouped into the following five areas: 1) Animal Health and Husbandry, 2) Exhibition Design & Management, 3) Education, 4) PR/Marketing/Development, 5) Conservation & Research. If you would like to participate, please submit a preliminary abstract (limited to 1/2 page) to: Jill D. Mellen, AAZPA Poster Session, Washington Park Zoo, 4001 S.W. Canyon Rd., Portland, OR 97221.

Rules and guidelines for your poster display will be mailed to you upon receipt of an abstract or by request. All abstracts will be accepted but poster selection will be limited depending on the number of participants. Deadline for submission of preliminary abstracts for the poster session is 15 June 1987. No submissions will be accepted after this date. If you have questions you may reach Jill at WPZ, (503) 226-1561.

Dates Set for '88 Conference/Bids Being Accepted for '89

The Conference Committee for the Tucson AAZK Chapter has announced the dates for the 1988 AAZK National Conference. The dates are September 11-15, 1988. These dates are earlier than previous conferences and were set in order to take advantage of the off-season room rates at the conference hotel.

The AAZK Board of Directors is now accepting bids from AAZK Chapters for the 1989 AAZK National Conference site. Those Chapters wishing to submit bids should contact any Board member or National HQ for specific direction and should plan on making a bid presentation at the 1987 Conference in Milwaukee where the members in attendance will vote on the '89 site.

New RC Appointed

Linda Anstandig, Detroit Zoo, has been appointed Regional Coordinator for the states of Michigan, Indiana, Kentucky and Ohio. Members in these states should contact Linda if they have questions or concerns about AAZK national projects and programs. Linda will also assist individuals in these states in forming local chapters.

Professional Members - Don't Forget To Vote!

Election ballots and biographical sketches on the candidates for this year's Board of Directors election were mailed to all AAZK Professional members in April. Ballots were sent to all new and renewing Professional members through 30 April 1987. Voting members are reminded that ballots should be returned to National HQ by 15 June 1987. Please use the return ballot envelope enclosed with your election materials and do not include anything except your ballot in this return envelope. They are not opened at National HQ, but simply counted and forwarded on to NEC Chairperson Jan McCoy. Therefore, if you include membership renewals, accessory orders etc., they will not be processed and you can expect a long delay.



Births & Hatchings



The Bronx Zoo AAZK Chapter reports the following notable births and hatchings for January through March. The Mammalogy Dept. is pleased to announce the birth, on 20 February, of a male White-cheeked gibbon (*Hylobates concolor*). The baby was born to our six-year-old male and our eight-year-old female who inhabit the tropical rain forest exhibit in Jungle World. It is their first and to the delight of visitors and staff, the family is doing very well. On 5 March, Clara, our 20-year-old Boringo giraffe (*Giraffa camelopardalis rothschildi*) gave birth to a healthy male, since named James V. The father, Alf, is 20 years old. James V has been integrated with the group and is growing by leaps and bounds.

Though born back on 23 November, the Mammology Dept. announces the birth of a male Polar bear cub (*Ursus maritimus*). Mother and son, who have been off-exhibit, are now entertaining throngs of visitors daily. The following births are included due to their status in nature or because ours is one of the few major programs for the species: 0.0.1 Pen-tailed bettong (*Bettongia penicillata*), 0.0.1 Indian fruit bat (*Pteropus giganteus*), 0.0.1 Silvered langur (*Presbytis cristatus*), 0.1 Nyala (*Tragelaphus angasi*), 0.1 Blesbok (*Damaliscus dorcas*), and 2.2.2 Mouflon (*Ovis musimon*).

The Ornithology Dept. reports the hatching of 0.0.2 Pesquet's vulture headed parrot (*Psittrichas fulgidus*). The two were hatched and are being raised at NYZS's St. Catherines Survival Center (SCSC). Also of note are 0.0.2 Malayan peacock pheasant (*Polyplectron malacense*). We believe our collection of Malayans is one of the most important in the country and attempts are being made to develop interest by other zoos.

The Herpetology Dept. has been busy also and reports the following notable hatchings, all of whom are doing well. There were 0.0.6 Radiated tortoise (*Geochelone radiata*) hatched at SCSC. And at the Bronx, 0.0.4 Red spitting cobra (*Naja nigricollis pallida*) hatched on 24 January.

Last but not least are the invertebrates. Notable hatchings during the last three months are the Wandering leaves (*Eurycnema herculeana*) and Walking Sticks (*Eurycnema herculena*). For both colonies this is their second generation. The Phillipine angiope orb weaver spiders are also on their second generation with four egg sacs observed developing. —Mark L. Hofling, Corresponding Secretary.

Wilderness Safari in Branson, MO is proud to announce numerous first-time successful births and hatchings at our wild animal park. In March the sight of a Tammar wallaby joey protruding head first from the pouch was quite an exciting moment for our keepers. Pouch movements in both females had been observed earlier this year. Our Tammar wallabies reproduced last year, however, both young (estimated under 90 days old) were found on the ground and unsuccessfully hand-reared.

The Park's first Collared Peccary was born in February. Also born in February were 0.0.2 American black bear. This was the first birth for this female and we are all looking forward to exhibiting "mom" and the playful cubs this season.

Our Emu flock has been very prolific this year with a total of 87 eggs being produced; 72 of these presently being under artificial incubation. One male in our flock incubated and hatched a clutch of 9 eggs; 2 did not hatch, 4 DNS, and 3 survived. Unfortunately, we were unable to leave the 3 Emu chicks with the parent to rear due to the threat of other birds in the flock that showed aggression toward the chicks. —Cindy Jaroszewski, Curator

Births and Hatchings. Continued

Zoo Atlanta AAZK Chapter's adopted keeper, Pundareeka Rao, has reported the following births at Sri Chamarajendra Zoological Garden, Mysore, India where he is employed: 0.1 Mandrill baboon, 1.2 Bengal tiger, 1.0 Brown bear, 0.1 Nilgiri langur (*Presbytis johni*) during November 1986 and 0.1 Brazilian tapir and 0.1 Leopard during January 1987.

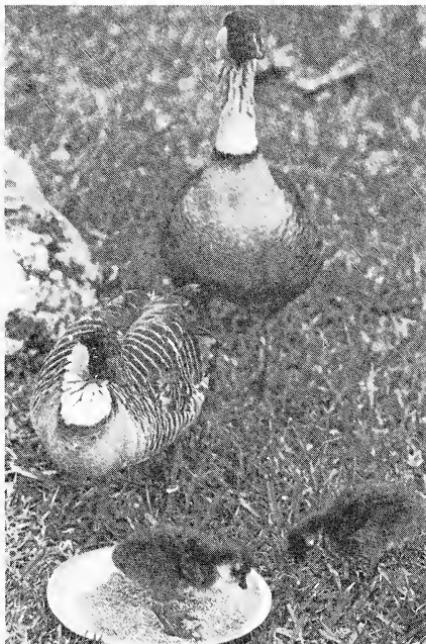
Zoo Atlanta Chapter Liaison Tim Kurkowski reports the following from that institution: 2.1 Black lemur, 0.0.1 Mona guenon and 0.3 Black-necked swan, all being parent-raised.

Cypress Garden's Animal Forest is home to two newly hatched Hawaiian or Ne Ne geese, an endangered species native only to the Hawaiian Islands. Green-gold at present, these young geese will change to a golden brown color when they reach maturity. In the wild the diet consists of such small vegetation as grasses and leafy plants. At Cypress Gardens they are fed a diet of small seeds, wheat, oats and a commercial gamebird mix, supplemented with greens, collards and lettuce. —*Cypress Gardens News Release*

On 26 February, 1987, the Tulsa Zoo's 21-year-old female Asian elephant and mother to our first baby elephant (born 5 October 1986) died at approximately 5:30 p.m. On the morning of her death she was very bloated and refused to eat even her favorite treats. She had a history of bloating. Her body was taken to Oklahoma State University for necropsy which showed the cause of death to be a twisted intestine. On 2 March, 1987 the decision was made to keep the baby elephant at the Tulsa Zoo and hand-rear him. Now, at 6 months of age, he is readily eating grain, produce, hay, alfalfa and two gallons of Infamil® a day. —*Karen Dunn, Large Mammal Dept., Tulsa Zoo.*

Bob Debets, Chapter Liaison for the Assiniboine Park Zoo Keepers Association, reports the following: Our Lion-tailed macaque troop in the Tropical House had two births during March and April. On 29 March, "Mindy" had her second healthy baby, which she is looking after very attentively. Three days later on 2 April, "Deborah" had her fourth healthy infant and is also being observed as an attentive mom. These additions to our Lion-tailed macaque population brings our numbers up to 8.18.2. These animals are kept in three separate troops, two on display and one off-exhibit.

On 18 August 1986 APZ received a pair of Goeldis monkeys from England. After the usual quarantine period of 30 days the pair was moved to the Tropical House where their specially designed exhibit was waiting for them. On 2 April the keepers in the Tropical House discovered that an expected birth had taken place. The baby and mom are doing fine.



A proud pair of rare and exotic Ne Ne geese watch over their recently hatched young at Cypress Gardens, FL. The species is native only to the Hawaiian Islands. (Photo courtesy of Cypress Gardens © 1987)



Coming Events

The 11th International Herpetological Symposium on Captive Propagation and Husbandry

June 17-20, 1987

Chicago, IL

For more information contact: Richard Hahn, Zoological Consortium, Inc., 13019 Catoctin Furnace Road, Thurmont, MD 21788 (310) 271-7488.

First International Children's Zoo Symposium

July 1-4, 1987

Philadelphia, PA

Symposium will focus on History and Philosophy, Design and Learning, and Animal Collection and Purpose. There will be pre- and post-conference trips to the Bronx and Baltimore Zoos plus much more. Keeper participation is strongly urged. For further information contact: Robert Callahan, Curator of Children's Zoo, Philadelphia Zoo, 34th & Girard, Philadelphia, PA 19104 (215) 243-1100, Ext. 300. The Philadelphia AAZK Chapter will reimburse the \$100 registration fee for a keeper attending this conference. The recipient will be chosen in a random drawing on 1 July.

"Applying Behavioral Research to Zoo Animal Management"

July 18-25, 1987

Seattle, WA

Hosted by the Woodland Park Zoological Gardens. For more information contact: William Karesh, DVM, Animal Health Dept., Woodland Park Zoo, 5500 Phinney Ave. North, Seattle, WA 98103.

The Society for the Study of Amphibians and Reptiles/ Herpetologists League Annual Meeting

August 9-15, 1987

Veracruz, Mexico

Hosted by the Institute of Biology of the National Autonomous University of Mexico. For further information contact: Richard Vogt, Estacion de Biologia Tropical "Los Tuxtlas", Universidad Nacional Autonoma de Mexico, Apart. Post 94, San Andres Tuxtla, Veracruz, Mexico.

Conference on Exotic Animal Husbandry II

August 13-15, 1987

Monroe, LA

To be held at Holidome (Holiday Inn), Hwy. 165 By-pass. For more information contact: R. A. Hahn, Zoological Consortium, Inc., Thurmont, MD 21788 (301) 271-7488.

Diet Notebook Update

By

Susan Bunn
Diet Notebook Coordinator
Minnesota Zoological Garden
Apple Valley, MN

Since the Diet Notebook was initially started by the South Florida AAZK Chapter in December of 1986, much has been accomplished. Response forms were outlined, data collection centers and coordinators were designated, and coordinators sent out requests for diets and then collected them. Although it may seem to have taken a time to produce results, the project is nearing the final stages. When I started in October 1987 much of the work had already been completed, thanks to all the hard working coordinators before me.

Currently the diets that have been collected are being put on computer and readied for printing. I would like to thank all of you who sent diets, and encourage those of you who have not to do so. You can contact the coordinators listed below for the response forms needed.

<u>Mammals</u>	Pending Board Appointment Until further notice please contact: Susan Bunn Minnesota Zoological Garden 12101 Johnny Cake Ridge Road Apple Valley, MN 55124
<u>Birds</u>	Kelly Westbrook Little Rock Zoological Garden #1 Jonesboro Drive Little Rock, AR 72205
<u>Reptiles</u>	Brint Spencer Minnesota Zoological Garden 12101 Johnny Cake Ridge Road Apple Valley, MN 55124
<u>Fish</u>	Garret Glodek South Florida Aquarium at the South Florida Museum 4801 Dreher Trail North West Palm Beach, FL 33405
<u>Invertebrates</u>	Susan Kenney John G. Shedd Aquarium 1200 South Lake Shore Drive Chicago, IL 60605

Barring any delays, we hope to have the notebook ready for purchase at the 1987 AAZK Conference in Milwaukee.



Zoo Trivia Exchange Sought

Collector of Zoo Trivia - patches, postcards, guidebooks, decals and so on - if fact anything zoo-related - would be most interested to hear from others with similar interests, with a view to exchanging items, ideas or whatever. If interested, please drop a line to: *Phil King, Assiniboine Park Zoo, 2355 Corydon Ave., Winnipeg, Manitoba, Canada R3P 0R5.*

Safety In Captive Wildlife Photography

By
Milton H. Tierney, Jr.
National Zoological Park
Washington, D C

Introduction

Whether amateur or professional, scientist or animal keeper, the wildlife and zoo photographer has a moral obligation to work with his or her subjects in the safest manner possible.

What kind of considerations are involved in captive wildlife photography? What precautions must be taken, what potential problems foreseen? Even a thorough knowledge of safe management procedures will not cover all situations that may arise in this important and rapidly growing field.

In this paper, I hope to sketch out some basic ground rules that are essential to the safety of the general public and the animal as well as the photographer. It is all too easy to become bogged down in details of equipment operation and technique; I will stress that consideration for the welfare of captive wildlife must be any photographer's primary concern.

Photography is perhaps the most useful and accessible tool available to keeper-researchers today. For sheer immediacy of impact, no other tool compares, and a single photograph has the power to tell a story that countless words, charts, and graphs cannot. Indeed, the life of an image often extends beyond the documentation of a single project or procedure, conveying new information to others in the field of species preservation as well as to an increasingly concerned public.

The animal keeper who wants to make photography a serious part of his or her work needs not only a working knowledge of the photographic process and zoology, but must also have the foresight to anticipate and prevent any mishap that might cause stress or harm to the ambassadors of wildlife that are his or her subjects. The one rule to keep in mind at all times is that there is no catch-all rule, for every situation--every individual animal and group of animals--is different. No matter how well the photographer "knows" his subjects, he must be prepared for the animal's behavior to change at any moment.

Research into the subject species' normal behavior and native habitat is the first step in any wildlife photography project. But as a zoo photographer, you will need "inside information" about the individual animals you will be working with. How is the animal, or group of animals, contained? What is the keeper-animal relationship? What individual behavior quirks do you need to be aware of? Discuss these questions with the species' curator and keeper. The more insight you have into your subject, the richer and more useful the end product will be.

With these broad guidelines in mind, let us move on to some specifics of safety.

Aggressive behavior takes a variety of forms, such as predatory, anti-predatory or competitive acts, each one serving a different function for the animal. Provoked by an unwitting stranger, an aggressive response can easily prove as or more harmful to the animal than to its target, the photographer. Therefore, the safety of the animal must be your foremost concern as you approach an enclosure. Look for any signs of nervousness or aggressive display--an animal trying to attack a "threatening" photographer may indeed attack the barriers--fence or bars--prevent it from reaching the threat, and thereby cause itself serious injury.

Approach is one step; actually entering the enclosure is another. The enclosure, although artificial, **is** the animal's territory, and any animal that has lived in the same territory for any length

Safety in Captive Wildlife Photography. Continued

of time knows its boundaries. Breaking those invisible boundaries will alert the animal, particularly prey species, to possible danger. Unlike their counterparts in the wild, zoo animals are always surrounded by human scent, but the sight and sound of your entrance will send important messages. Walk slowly and restrict your movements as you cross a guard rail or open a gate to reduce the risk of being interpreted as a threat. Clothing is also a consideration: an animal recognizing a zoo uniform or street clothing may stimulate an animal to become aggressive or take flight, or it may actually have a calming effect, depending on the individual animal. Perhaps the best idea is to enter an animal's territory by imitating its keeper's daily routine. This may put the subject at ease so that it will allow you to approach.

Just as an aggressive animal may harm itself by attacking the barriers when you are "outside", so a nervous animal may cause itself injury or death trying to escape from you on the "inside". It may take flight to escape predation and run into glass, walls, or fencing. Therefore, you should have your equipment ready--lens, film, flash, and so on--and do your job as quickly as possible. If the animal seems nervous or strikes a threatening pose when approached, the photographer would be wise to keep a good flight distance and have a pre-planned escape route in mind.

Under certain conditions, some animals require ever greater caution--a deer in rut, for example, or a mother with a newborn can turn aggressive in an instant. First-time mothers should be left completely alone to prevent the parent from injuring its young out of panic.

A number of commonsense techniques can help cut down or eliminate stress to the subjects. A telephoto lens or a blind, when practical, can bring you closer without alarming the animal. Introduce or build the blind slowly over a period of time to accustom the animal to its presence. Likewise, plants and tree limbs that block your line of sight should be moved gradually over a period of hours or days. (Small mammals, reptiles, and birds may interpret any sudden movement as being predatory and will flee or experience stress.)

Remote control devices on photographic equipment are also very useful in this respect. In general, an animal will not associate a camera and tripod with a person, unless the person is standing nearby. The animal may ignore the equipment or simply investigate it until the animal is assured that it is harmless. Of course, this is not practical when working with inquisitive species like monkeys and otters. In the case of large animals, equipment must be secured in order to prevent damage or injury to the animal.

Small, highly-strung animals may react to camera noise, which is a special problem with older equipment. Wrapping foam rubber around the body of a still or movie camera should make a considerable difference.

Film or video equipment often requires the use of floodlights. Always be sure to keep flood lamps at a safe distance from exhibits to prevent glass breakage--and remember that an electronic flash may also break glass if it is placed against it and discharged. Flood lamps can also cause a lethal rise of temperature inside the exhibit. A 500- or 1000-watt flood lamp generates from 450 to 700 degrees Farenheit, so a fan should be used to circulate air around the lamps. A thermometer taped inside the exhibit, out of camera range, will alert you to any rise in temperatures. In addition, stress may be reduced in small species by associating food with flood lights or flash use.

Use infrared film to photograph nocturnal animals as normal flash or flood lights can cause stress and behavior problems. You can enhance normal behavior by using a Kodak™ Wratten #87 filter over your light source when using infrared film or video equipment that has been converted to infrared sensitivity.

When documenting an immobilized animal, use a flash only when necessary and try to protect the animal's eyes with a cloth. Discharging a flash at close range may hurt the animal's eyes or cause it to jump, possibly harming itself or others nearby. Unless asked to come closer, keep your distance so as not to interfere with the veterinarian's work.

Safety in Captive Wildlife Photography, Continued

If elaborate lighting is required, it would be best to do any shooting before or after hours or during the zoo's off season so accidents can be avoided. The welfare of the public and employees is as important as that of the animals you photograph. Zoo visitors are busy keeping track of their children and watching the animals on display--they should not be expected to dodge a photographer's equipment. Small, confining hallways and dim lighting make indoor buildings a particular hazard. When shooting indoors, hold your camera and flash whenever possible--a child may not only trip on a lamp's electrical cord but could also be severely burned by the extremely hot lamps. To avoid problems, tape electrical cables down, weigh light stands and tripods down, set up equipment out of the public's reach, and rope off the area so that visitors will go around instead of through your equipment. Take up as little space as possible, storing unused equipment under the tripod or in any other safe location. When it is impossible to close or rope off an area or the grounds are very crowded, you would be wise to abandon your efforts and try again at a later date.

A photographer observing his subject through a camera lens next to a cage can only keep track of that particular animal, and not the others to his left or right. That second leopard or baboon may be upon you before you can focus. A dependable assistant who is familiar with animal behavior must be used under such circumstances, for obvious reasons. Never try to photograph a dangerous animal next to cages, open vehicle windows, or inside enclosures without an assistant.

As I have repeated throughout this paper, the effects of stress on animals cannot be overstated. So far, I have mentioned only short term effects, but animals will often go off their food for a day or longer following a photo session, and other long term effects of stress include nonbreeding or stereotypical behavior. Stress, short or long term, must always be considered by the photographer and eliminated to the greatest degree possible. Trash is just as dangerous, and film boxes, plastic bags, and especially instant photographic materials must be properly disposed of. Instant photographic film uses a high alkaline activator that may be lethal if ingested.

Many of the steps you take for the animal's safety also serve to protect you, the photographer. But such measures will not cover all situations. Anytime you must take chances to get a clear, important photograph of your subject, you must take all possible precautions to prevent injury to yourself and the animal. Discuss your plans, objectives, equipment, time frame, and help needed with the curator and animal keeper involved.

We have a moral obligation to learn about and to protect this world and its many forms of life. Not only for ourselves and our offspring but most importantly for the offspring of life itself. A wildlife or zoo photographer may have to go to extremes to demonstrate responsible photographic techniques. But better no picture at all than one that causes harm or distress to wildlife. Indifference or arrogance is inexcusable and cannot be tolerated on any level, be it visitor, keeper or researcher working on his Ph.D.

As people begin to realize their obligation to preserve and protect the natural world, education becomes increasingly important. As one of the sources of educational information, we photographers and researchers have the responsibility to record this essential information in the safest manner possible. As human beings, we, a species self-imposed on top of the "evolutionary ladder", have a tremendous moral obligation--an obligation to the safety and welfare of the vast number of biological species that we have placed below us, and most of all to our captive wildlife.





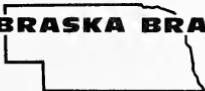
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Watch this space for what's new for zoos!

The Short-Nosed Echidna at the Los Angeles Zoo

By
Kay Paull, Animal Keeper
Los Angeles Zoo, Los Angeles, CA

Little is known about the echidna either in its wild state, or of the few found in captivity. Echidnas are unique in that many of their characteristics indicate evolution from reptiles or reptilian-like ancestors and not necessarily from marsupials or placental mammals, but showing their own distinct lines of evolution.

The order Monotreme is made up of two families: the Platypus (*Ornithorhynchus*), and the Echidna or Spiny Anteater (*Tachyglossidae*), which is comprised of two genera, the short-nosed echidna, *Tachyglossus*, and the long-beaked echidna, *Zaglossus*, both inhabiting Australia, Tasmania, and New Guinea.

Echidnas have hair, mammary glands, four-chambered hearts, a jaw bone structure, a high hemoglobin content, and development of areas of the pallial region of the brain; characteristics found in most mammals. However, eye structure, three middle ear bones, certain skull bones, pectoral girdle, some features of the ribs and vertebrae, reproductive and excretory systems, stance, carriage, and the fact they lay eggs shows a high resemblance to reptiles.

Echidnas have a body covering of fur with dorsal and lateral spines. They have broad powerful feet for digging, a vestigial tail, long and tubular rostrum, a small mouth and teeth are absent. Smell is considered acute and their eyesight is comparable to a rats.

In both sexes the posterior end of the intestine, the ducts of the excretory system, and genital ducts all open into one chamber, the cloaca, giving all three systems one external opening - therefore the name monotremata.

The Los Angeles Zoo houses 2.3 Echidnas (*Tachyglossus aculeatus*). Since the individual echidnas are very much alike in size and in coloration, we have employed the use of markings. We currently mark their quills with nail polish - females marked on the right side of the back and males on the left. Different colors and numbers of quills painted determine individuals. As no marking is permanent, as quills fall out or markings wear off, they should be re-marked on a regular basis. Other zoos do not use such entertaining methods of marking, but use plastic, colored tubing stretched over the quill or employ the use of leg banding.

The species we house are found in most parts of mainland Australia and Tasmania, and also south and central New Guinea. The echidnas in the wild inhabit rocky, sandy and forested areas as well as dry to very damp ones. Here in L.A. they are housed in a nocturnal exhibit at the Koala House. The floor area is 38' x 92' and of dirt substrate. Chain link is buried three feet down to prevent our eager diggers from disappearing. Temperature ranges are fairly constant and held at 68 degrees Fahrenheit. Our light cycle follows Australian seasonal lighting on automatic timers. Also within the exhibit area is a small running stream, many tree logs, and hollow rocks and burrows which are favorite areas of the echidnas. Within the eucalyptus grove an echidna might find termites, nesting materials, a community food tub, a potoroo, a sugar glider, a koala, and possibly another echidna.

Social behavior of the echidna is relatively unknown, but they are considered a quite solitary animal. Encounters of the echidna kind are generally a quick passing, a short gathering at the communal food tub, or a male seen closely following a female during the breeding season.

The Short-nosed Echidna at the L.A. Zoo, Continued

We are very fortunate to have such a nice collection of echidnas. Although they do well in captivity (living up to fifty years), breedings are rare and births even rarer.

Echidnas are generally easy to care for. They need a dirt or earth substrate allowing them to dig or burrow in order to keep their foot pads healthy. They should have areas in which to hide and nest, a balanced diet and free-choice access to water.

According to Griffiths (1968) there is great speculation whether echidnas should be considered nocturnal or not. Echidnas have been found to be active in broad daylight as well as at night, but more active when it is quiet. In a zoo setting, activity levels are higher when patrons are quiet or after closing hours.

Exhibit areas should have places to crawl or climb but fencing or other climbing objects placed too high up may be dangerous as they can suffer great damage in a fall. Here at L.A. we try to provide a naturalized enclosure, but the echidna have also utilized unnatural artifacts such as the cement stream area which now has an elaborate tunneling system. Artificial rock shells are another source for nesting holes. By using powerful front legs to dig under the rocks, the echidna achieves a pre-built cave.

In taking care of echidnas one should consider weighing them on a regular basis as a check of health and seasonal activities. To weigh an echidna is easy, to find one not too difficult, to catch one is..... Echidnas have great defensive strategies from digging a quick shallow hole and exposing erect quills which easily pierce gloves, to rolling into a ball, nose and legs withdrawn with exposed quills, to wedging themselves between two substrates. The method we use is to quickly grab the back hind feet and lift the animal up before it has a chance to burrow. During the breeding seasons, or when there is the possibility of eggs or pouch young, we incorporate the use of clear plexiglass for examination of the female's pouch area before lifting the animal off the ground by the hind feet. Placing the plexiglass on the ground in areas frequented by the individual echidna, you will eventually find one investigating the foreign object. By gently pushing the echidna onto the plexiglass it can then be lifted enough to check underneath for eggs or pouch young. This technique eliminates the possibility of the female dropping the egg or infant, and also avoids any extra stress due to weighing and handling.

So now you have your catch, you may wish to mark or check bands for identification. Determination of sex and of each individual is important. Once sex is determined either through previous karyotyping or finding spurs on the hind ankles of a mature male, you can re-mark each individual.

Now check for fleas, ticks and powder if necessary. You are now ready to weigh your prize - the easiest method being an official echidna weighing container available through finer zoo equipment companies and hung on a suspended scale.

To keep an echidnas' weight regular, a specific diet needs to be prepared. In the wild echidnas have been found to eat ants, insects, beetles, worms, but generally termites are favored. Echidnas have been known to attack ant mounds in August, September and October. The mounds contain easily accessible male and female worker ants, the females are particularly loaded with fat. Because at the end of October when the female and male worker ants leave, the echidna leaves the mound (despite the fact the other ants remain), it has been concluded that the echidna has a preference for 'fat laden' female ants.

An adult echidnas' intestinal tract mucosa produces the enzymes trehalase, isomaltase and maltase. The trehalase is possibly related to the fact that insects possess a high level of trehalose, the principle sugar of insects. Echidnas hold very low levels of lactase and sucrase which makes digestion of dairy products difficult although echidnas seem to enjoy milk in their diet.

In captivity the usual diet consists of: ground meat, eggs, milk, yogurt and vitamin supplements. Although echidnas have survived and lived healthy long lives on this diet, it

The Short-nosed Echidna at the L.A. Zoo, Continued

should also ensure necessary elements and nutrients for a happy echidna to progress to breeding and nurturing of young. Breedings in captivity are rarely seen and production of offspring is even rarer.

The L.A. Zoo diet consists of 2 cups of ground meat, 2 cups of baby cereal, 4 cups water, 6 Tbs. egg yolks, 6 ounces of cottage cheese, 6 Tbs. yogurt and 2 Tbs. vitamin powder. The ingredients are finely blended to a superb, tast-tempting delight. The slop is then poured into two shallow metal trays held securely to a circular tub with a large metal mesh top, to allow the echidna to eat, climb over the mesh without walking through its meal, and to avoid spillage by raiding bands of potoroos. The echidnas are also free to capture any beetles, ant or termites within the exhibit.

I do, however, feel the diet could/should be supplemented with ants and termites as it appears the diet is presumably missing something found in the echidna's natural diet which is inhibiting or at least not contributing to breeding and birthing activity. Some zoos have reported weight losses due to varying circumstances. One example was that the stools were extremely moist or runny and not well formed. This can generally be attributed to the high content of milk in many zoo diets. According to Finnie: amino acids can inhibit reproduction. Yogurt added to the diet is a form of lactose which converts the lactose in milk to glucose then into galactose.

The Australian breeding season begins in June with a peak in July, with some reports that breeding activity continues through early September. Although no territories are set up by the males it appears that the males are attracted by the cloacal glands of the females. Females develop a temporary pouch during the breeding season which acts to hold the egg in place on the abdomen. We have seen pouch development in some of our females during November, December and January which corresponds to Australian winter breeding season. The male echidnas have seasonal changes in the testes which become larger with a reduction in size following the breeding season. They possess paired testes, no scrotum and testes are found internally, posterior to the kidneys and attached to them by a fold of peritoneum (abdominal lining).

Breedings are ventor to ventor; either with only tails together or nose to nose and tail to tail position. No breeding has ever been recorded at L.A., but we do see breeding activity.

Gestation is estimated at thirty days. The female oviducts open separately into the cloaca. It is within the oviducts where the eggs are fertilized. It is possible for a female to be bred and not lay for a considerable period of time as in reptiles. They apparently have the ability to retain sperm. Generally only one egg is laid. It is round and about the size of a hazel nut. Incubation has been found to be 10 to 10.5 days.

On 12 December 1984, our female echidna, Little Bit, had been found in a shallow circular depression which she had dug with various roots and grasses found in the exhibit. The area she had chosen was not of particularly great substrate or location. It was at the base of a koala-frequented tree with firm dirt and heavy foot traffic by keepers passing this area. It appeared as though Little Bit was nesting, having chosen this particular spot for whatever reasons and having found nesting materials suitable to her liking. She remained in this spot for two more days and was never observed leaving it to eat, drink or defecate. She remained curled in a defensive position, only seen rotating or nosing about. Why was she there? Her breathing seemed unusually noticeable and heavy. Other references have never discussed nesting sites or areas where one stayed days on end except during torpor or hibernation. Finally concern for her health forced us to excavate her and give her a thorough examination. She appeared normal, however she did have an egg in her small rudimentary pouch. The egg was dislodged when she was picked up so the egg was carefully placed back into her pouch and she was gently released. She again resumed her site for four more days. Unfortunately, the egg was later found pierced by her quills.

Only one other time was Little Bit found supposedly nesting. After a few days she abandoned her site and no egg was found. Was her behavior possibly due to illness, torpor?

The Short-nosed Echidna at the L.A. Zoo, Continued

Of those fortunate enough to exhibit echidnas, this is where they again become a mystery. Eggs are supposedly transferred directly from cloaca to pouch, how or by what means other than staying tightly curled minimizing the cloacal-pouch distance is unknown.

On the ninth day the egg may become slightly dimpled or shriveled and hatching occurs at 10 to 10 1/2 days. The hatchling cuts its way out of the egg by the use of an egg tooth. Hatchlings are naked and approximately 12mm in length and 378mg in weight. The young then find their way to the areola on either side of the pouch and do not lap the milk as originally thought, but suckle as any other mammal would do. Infants have been recorded to butt against the areola with the snout during nursing. Young are carried in the pouch to about 55 days of age and then ejected. By this time they weigh about 330 grams and spines are just beginning to develop. The female will deposit her young either at a nest site or borrow and return to suckle from time to time.

Zoos which have been fortunate enough to have offspring generally find the youngster on the exhibit floor or unfortunately expired. It appears that the female may only return every 1 1/2 to 2 days to suckle her young. To me this is a critical time for the female and her offspring to be totally undisturbed. Observational recording on pouch young left at nesting sites have also shown infants abandoned for whatever reasons. It would seem imperative to keep the mother in close proximity, available to food, regular or constant temperature and undisturbed by other exhibit inhabitants.

When the female does return to suckle her young, she gently nudges it under her belly while the youngster rolls onto its back, hangs onto her belly hair and thrusts its snout into the pouch. Intake is 10% of the infant's weight, enough to last a day or two. Ingestion records are lacking, but have been observed at 20 to 30 minute intervals. It is guessed that echidnas continue to nurse for approximately six months.

So here we pose the question: Why are zoos not successfully breeding echidnas? Some good reasons might be: poor exhibit enclosure area, substrate, noise/disturbance levels, assurance of properly sexed cagemate, or something lacking in the diet. But what about temperature and light variations?

Although the echidnas at L.A. have only within the past few years had such a optimal enclosure area as the Koala House, it appears that a certain stimulus is missing. We have seen only one egg produced and some breeding behavior, yet no breeding. At the time leading up to the egg we had a temporary failure in the air conditioning system during high summer temperatures. On 7 September the exhibit temperature rose to a high of 90 degrees Fahrenheit. Temperatures held between 84-91 degrees F. until 15 September. This gave a great variance in temperatures as the Koala House is normally kept at 68 degrees F. and to advance to 91 degrees within a week's time had to have some effect on the echidnas. When the air conditioning system returned to normal temperatures again remained at a constant 68 degrees F. Was this a possible trigger to breeding behavior, or laying of eggs?

In the wild echidnas avoid extreme temperatures as they do not pant or sweat to lower body temperature. They stay under cool rocks or burrow and become more active when the day cools.

Although echidnas are not good at regulating body temperatures at high surrounding temperatures, they are considered to have good theomoregulation at low surrounding temperatures. Echidnas are considered by some as hibernators...defined as warm-blooded animals which abandon their warm-blooded state in an almost purposeful manner and sink into a torpor in which the body temperature approaches that of the protective cave or burrow. Torpor is natural to the echidna and it can arouse without external source of heat just as all other hibernators. They have the tendency to burrow when the temperatures fall and then enter into torpor. During torpor they experience a weight loss of 3-8 grams per day. During their torpor the body temperature will remain slightly higher than the surroundings, and burrowing seems to be a factor in the retention of body heat. The ability to enter torpor is connected with the activity of the adrenal glands, which are essential for resistance to cold stress, and help maintain certain plasma glucose levels during torpor. Without the adrenal glands one could not return to normal body temperature following torpor when the body temperatures are within one degree of ambient.

The Short-nosed Echidna at the L.A. Zoo, Continued

Others say the phenomenon of torpor correlates with seasonal abundance of termites and ants in the wild. Is this what draws the echidna out of its torpid state?

Captive echidnas enter torpor also. Some have been recorded to give up feeding for up to 72 days, but generally 2 to 29 days, even when food is available. We have suspected our individual echidnas go into torpor even though they did not experience cold extremes - as for days on end an individual will not be seen during normal activity hours or at the communal food tub.

In the wild echidnas go into torpor in cool winter months. When aroused from this state they go into breeding activity and then the seasonal availability of ants and termites begins. It is possible that in September our high temperatures conveyed a summer seasonal correlation, then the lowering temperatures correlated going into winter - or torpid months. From past observational periods January shows some breeding activity; February, March and April being high in activity periods and feeding periods - these correlate to the Australian breeding months and then the availability of ants and termites.

It is quite possible that we accidentally imitated a necessary element to echidna seasonal behavior and therefore a breeding response. It would be interesting to note activity patterns here at L.A. year-round, and also to obtain information from other zoos as to torpid months, behaviors, temperature variables during the year, etc.

So now we have come to the conclusion of my paper having discussed what an echidna and monotreme is, how we house our echidnas, husbandry techniques, breeding activities, feeding habits, birth and the nurturing of young. But what I would like to see in our future in caring for these unique animals is more data collected on the following: activity patterns, feeding activity, breeding behavior, diet, and temperature variables, not only from L.A. but other zoos as well. I would also like to see enhancement/experimentation with their diet and seasonal temperature changes in an effort to trigger breeding activities and thereby improve the chances at L.A. for the successful propagation of the short-nosed echidna.

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Conference '87

October 4-8, 1987

Second Call For Papers

Papers will be accepted on a wide range of topics concerning zookeeping and animal husbandry, such as breeding, hand-rearing, diets or exhibits. Examples of papers can be found in the December 1986 issue of AAKE.

Papers will be published in the Forum, so use the "Guidelines for Typing Papers for AAZK Conference Proceedings". The guidelines can be found in the April 1987 issue of the Forum.

Papers will be limited to 20 minutes followed by a five-minute discussion period. An outline or abstract must be submitted by 15 July, 1987 along with the following information:

Name of Presenter _____

Zoo Affiliation _____

Position/Title _____

Title of Paper _____

Equipment Needed _____

Send to: Papers Committee, AAZK Conference '87, Milwaukee County Zoo, 10001 W. Bluemound Road, Milwaukee, WI 53226.

Cross-word Puzzle Clues

Across:

4. All papers will be published where?

17. 1987 is AAZK's twentieth_____?

Down:

20. Carnivore used on the Conference '87 logo.

1987 AAZK NATIONAL CONFERENCE REGISTRATION FORM

OCTOBER 4-8, 1987
Milwaukee, WI

Please type or print. (One name per form)

Name _____

Address _____

City _____ State/Province _____

Zip Code _____ Telephone # (_____) _____

Zoo Affiliation _____

Area of Interest _____

AAZK Committee Member? _____

Will be submitting a paper: Yes No
(\$20.00 will be refunded from registration fee on acceptance of paper.)

Participating in Zoolympics: Yes No

Bringing auction item: Yes No Describe briefly _____

Vegetarian: Yes No (Specify Type _____)

Banquet Entree: (check one) Beef Chicken Vegetarian

Are you interested in a Conference T-shirt: Yes No (S M L XL)

AAZK Membership Status and Fees:

Member/Spouse	\$55.00 each
Non-Member	\$70.00 each
Late Fee	\$10.00 (after August 15, 1987)

Total Fees Enclosed \$ _____

One-day rates for individual conference events are available. Contact Steven M. Wing for details.

Arrival date and time: _____
Let us know ASAP if you need pick-up assistance.

Please make payment to: AAZK Milwaukee Chapter

Return this form with your fee to: Conference '87, Milwaukee County Zoo, 1001 W. Bluemound Road, Milwaukee, WI 53226.

HOTEL RESERVATION REQUEST

1987 AAZK National Conference

October 4-8, 1987



Name _____

Address _____

City _____ State/Province _____

Zip Code _____ Telephone # (_____) _____

Date of Arrival _____

Date of Departure _____

Guaranteed by: Credit Card Check

Credit Card _____

Card # _____ Expiration Date: _____

Rooms will be held only until 6:00 p.m. unless guaranteed by either credit card or one night's deposit.

	<u>Dbl./Dbl.</u>	<u>King</u>
1 Person _____	_____\$50.00	_____\$50.00
2 Persons _____	_____\$50.00	_____\$50.00

I will be sharing a room with _____

We will be able to match-up single delegates with roommates.

Do you need a roommate: Yes No If yes, state restrictions (i.e. male, female, nonsmoker, etc.) _____

We will make every effort to match roommates, but we cannot guarantee it.

Return this form to:

Conference '87
Milwaukee County Zoo
10001 W. Bluemound Road
Milwaukee, WI 53226

AAZK Birthday Party!

Let's Celebrate!



This year the American Association of Zoo Keepers will be celebrating its 20th birthday. Won't you come and celebrate?

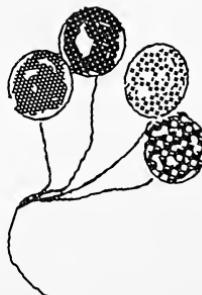
Monday, October 5th, you are invited to an old fashioned birthday party...birthday cake...ice cream...balloons... What better way to celebrate 20 great years!

The founders of the American Association of Zoo Keepers did a great job forming a strong foundation for us to build upon. Several founders and key people intimately involved in AAZK history will be in attendance.

Time has been set aside for a panel discussion on the growth and development of AAZK. Let's look back and hear from some significant members of the board. Let's discuss where AAZK is headed.

Our founders will be honored during this evening's activities. We may even have a surprise guest or two!

Remember - Monday, October 5th, the delegates to the 1987 National Conference will have their first paper session that day. Dinner will be on their own. Why not complete your day with an old fashioned birthday party!



Post-Conference Activities in Chicago

Conference delegates may extend their time in the Midwest, visiting the zoos and aquarium in Chicago, on the two days following the National Conference in Milwaukee. Busses will leave Milwaukee in the morning on Friday, 9 October, arriving at Lincoln Park Zoo for an orientation to the Chicago activities and an introduction to this zoo. There will be behind-the-scenes tours and lunch provided there. Delegates will then be transported to the John G. Shedd Aquarium for tours of their working areas and a reception.

The evening will be left free for dinner on your own, and a taste of Chicago night life. Some of our very experienced Keepers are making a list of recommended attractions, especially places to hear music and dance.

KAL and hotel accommodations will be available. The hotel is in the heart of downtown, and rooms have been calculated for multiple occupancy to keep expenses down. Each roomfull must make their own arrangements directly with the Best Western Inn of Chicago (312) 787-3100, mentioning that they are part of the AAZK group. One pair of keepers in a queen-sized bed will be charged \$70; two pairs of keepers in two double beds will be charged \$75. If you need assistance in pairing up, contact Dominique Galiano at Lincoln Park Zoo (312) 294-4760. For Chicago, these room rates are very reasonable and the inn is at Ohio and Michigan, within walking distance of some of the best features of our city. **Please note: hotel reservations must be made three weeks in advance of the trip or before 18 September 1987.**

Saturday morning will see delegates on their way to Brookfield Zoo for a full day of touring, then a return to Milwaukee. The cost of the post-conference tours will be determined by the cost of transportation and will be announced soon.

To register for the days in Chicago, please fill out the accompanying questionnaire and send it to: *Pat Sammarco, Lincoln Park Zoo, 2200 N. Cannon Dr., Chicago, IL 60614.*

Post-Conference Response Form

Are you planning to attend the Milwaukee AAZK Conference? _____

Are you planning to attend the Post-conference trip to Chicago? _____

How will you get to Chicago? _____ Bus provided by fee? _____
Own means? _____

Need pick up at _____ O'Hare Airport _____ at Midway Airport
Arrival Time _____

Will you remain in Chicago overnight on 9 October? _____

at Best Western Inn In Chicago? _____
in a KAL home? _____
make your own arrangements? _____

Will you leave Chicago on 9 October? _____

Will you need a ride to: Milwaukee? _____
O'Hare Airport? _____
Midway Airport? _____
Train Station? _____
Time: _____

Will you leave Chicago on 10 October? _____

Time: _____

on bus provided by fee? _____
(return to Milwaukee)
from O'Hare Airport? _____
from Midway Airport? _____
by train? _____
by own means? _____

Any other comments?

AAZK Regional Coordinators

Co-Directors of Regional Coordinator System

States East of Mississippi - Diane Krug, Rt. 1, Box 273, Hilliard, FL 32097 (904) 225-9559 [work]
(904) 845-4279 [home]
States West of Mississippi - Debbera Stecher, Woodland Park Zoo, 5500 Phinney Ave., North, Seattle, WA 98103. (206) 625-5402 [work] (206) 745-8198 [home]

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for the states of NY, VA and the District of Columbia

Denise Robinson, Philadelphia Zoo, Philadelphia, PA 19014
for the states of PA, DE, NJ, MD

Linda Anstandig, Detroit Zoological Park, Detroit, MI
for the states of MI, IN, KY, and OH

VACANCY - FOR THE STATES OF TN, NC, SC, W. VA
Larry Sammarco, Lincoln Park Zoo, Chicago, IL 60614 (312) 294-4660 [w]

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Tim Kurkowski, Zoo Atlanta, Atlanta, GA 30315 (404) 624-5600 [w] (404) 428-0535 [h]
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for the states of LA and MS

Vikki Bohnert, 2264 Winkler Ave., B-11, Ft. Myers, FL 33901
for the state of Florida

John R. Turner, Denver Zoo, Denver, CO 80205
for the states of CO, NM, and TX

Steve Tigges, Tulsa Zoological Park, Tulsa, OK 74115
for the states of OK, NE, KS, ND, and SD

Laurence Gledhill, Woodland Park Zoo, Seattle, WA 98103 (206) 625-5497 [w]
for the states of WA, OR, ID, MT, WY and AK

Art Goodrich, San Diego Zoo, San Diego, CA 92112
for the states of CA, NV, UT and AZ

Honolulu AAZK Chapter (Dan Vitiello, Pres.) (808) 923-4772 [w]
for the Hawaiian Islands

Neville Howard Pike, Metro Toronto Zoo, Box 280, West Hill, Ontario, Canada M1E 4R5
for the Province of Ontario, Canada

Bob Debets, Assiniboine Park Zoo, 2235 Corydon Ave., Winnipeg, Manitoba, Canada R3P 0R5
for the Province of Manitoba, Canada (204) 489-3893 [h]

Marcia Rasmussen, Calgary Zoo, P.O. Box 3036, Stn. B., Calgary, Alberta, Canada T2M 4R8
for the Provinces of Alberta and British Columbia, Canada (403) 235-5461 [h]

Need membership information? Want to learn more about AAZK or start a chapter or become more active - then call your RC! There is still one opening for an RC position for the states of TN, SC, NC, and W. VA. If you are interested, please contact Diane Krug, Eastern U.S. Regional Co-Director. You may call Diane collect at her home phone (904) 845-4279 evenings after 6 p.m. EST. This position offers a great opportunity to become involved in AAZK and to provide a valuable and necessary service to your Association.

New Bird Exhibits at the Dallas Zoo

By

*Celia K. Falzone, Bird Keeper
Dallas Zoo, Dallas, TX*

Old, worn out exhibits are a common problem among zoos. In 1983, the Dallas Zoo decided to replace a row of bird exhibits. Renovation of the existing enclosures was not a consideration and so discussions commenced to determine the best design for new exhibits. It was agreed that, due to the ongoing expansion of the zoo, permanent or long-term enclosures were not necessary. Several zoos are now experimenting with nylon netting cage construction as an alternative to traditional wire. The decision was made to try this material rather than the currently used welded wire, for the construction of these new cages intended for the containment of ground hornbills, eagles, condors, and other large birds. This was an excellent opportunity to test the feasibility of using the netting in future exhibits.

Replacement of the bird enclosures was overdue. They were structurally unsound, old exhibits with patches on top of patches and constructed with a pipe framework and welded wire which required repainting as the old paint wore off. Pools with small pipes emptied slowly, draining above ground. Low water pressure made cleaning a difficult and time-consuming task. Aviculturally inadequate shelters with dirt floors were located within each cage. These were the most significant defects in need of correction.

Input for the design of the new exhibits was received from all levels of personnel in the hope that with careful planning, no major design flaws would be built into the enclosures. Following relocation of the resident birds, a major task in itself, the existing enclosures were razed.

Construction began from the inside out. New dirt was laid down and pools and shelters were built. Six cages were built with three main structures for the shelters. Each structure was located between two cages and divided by a common wall with a connecting door. This allowed keeper access between cages without going outside and also meant that one end could be shut to allow birds access to the whole structure if necessary. In addition to the connecting door, there was a door on each end to allow animal access from outside the exhibit. The shelters were constructed of cinder blocks on a concrete floor. Each half was equipped with a light fixture for normal lighting or a heat lamp. Additionally, each house contained indoor and outdoor wall outlets for the use of space heaters or power tools. Light switches and separate breakers for all electrical fixtures were installed in each. The building design allowed for free or limited access (animals could be locked inside for cold weather or for restricted activity during medical treatment.) The original fiberglass roof proved too weak, requiring replacement with a metal roof capable of withstanding the weight of condors and the abuse of ground hornbills.

Artificial rockwork concealed the front of these block houses from public view. A natural appearance was achieved by the painting and shaping of the concrete rock.

The second major structure within each cage was the pool. Each pool varied in size and shape to promote non-uniformity among the six exhibits. While some were designed for a particular species, others were intended to be more flexible in their usage. Pool construction was accomplished with a concrete/fiberglass mixture intended for strength. Unfortunately, after a couple of years it became apparent that the pools were too thin and that the fiberglass made them somewhat porous so that slow but steady leaks began appearing and the ground hornbills began inflicting significant damage to their pool. (One pool has already been rebuilt and three others are scheduled at the time of this writing.) Each pool was given a two-inch overflow pipe allowing a continuous supply of fresh water and the drains were connected to the sewer system.

New Bird Exhibits at the Dallas Zoo, Continued

The main entry to the cages is through a gate which is wide enough to allow a wheelbarrow to pass through. The entryway has a pipe framework and the gate is pipe and welded wire. Because the cages are all elevated above the service area walkways, ramps are necessary for wheelbarrow access. Two doors access each cage, the main service area and the keeper entrance to the shelter.

In addition to the artificial rock fronting the houses, some landscaping is involved. The cages are built on an incline so that water runoff erodes the soil. To counter this, terracing is used very effectively to lessen the grade and alleviate erosion of the ground. Also, grass is planted and encouraged to grow where possible to hold the soil. The success of plants (bushes, grasses, etc.) in each exhibit is directly related to the species of bird involved. In some cases, keeping plants alive and replacing dead ones is a continuous battle. Because each cage is an individual unit, tall grasses are planted between them as a visual barrier which adds more plant life to the cages without it being within reach of the more destructive birds.

After the pools, houses, and gates were completed, it was time to hang the netting. Telephone poles were used to suspend the netting. Each cage was an individual unit and the four sides and top panels of each were sewn together in the factory. The panels were made of a black, 1 3/4-inch stretched mesh, knotless nylon netting that was ultraviolet ray treated. The small mesh had been selected to keep birds in as well as out since sparrows and other wild birds could not penetrate it. When the first cage was installed, it quickly became apparent that the mesh was too small for easy public viewing. New front panels with a 2 1/2-inch mesh were ordered for all six cages. The original panels were removed and the new panels sewn in with 3/8-inch diameter braided Dacron® rope.

Each cage was suspended and the bases were secured to concrete perimeter walls buried in the ground. The six cages vary somewhat in size from 15 to 23 feet high, 29 to 36 feet deep, and 22 to 33 feet wide.

As stated before, one reason for selecting the nylon netting was a time factor. The exhibits were intended to be temporary. The expected life of the netting is approximately five years before beginning to wear. Netting is also very flexible and less damaging. When startled birds fly into the side or top of the cage, the netting gives, allowing a softer impact and reducing the risk of injury. Wire tends to cut and scrape when a bird collides with it. Plumage of birds in wire enclosures often remains frayed and broken. If wire is painted black to make it less visually obtrusive, it must be repainted periodically. The netting is already black. Repairability of netting is very good as it is easily sewn together or a patch sewn in with ultraviolet treated nylon twine. Aesthetically, netting is more appealing than welded wire even if only because it looks different. Welded wire bird enclosures are very common and tend to look much alike.

The major problem and disadvantage of using nylon netting is that squirrels chew through it very quickly and easily. Although it withstands the abuse of the birds pulling and pecking it, it has no defense against these rodents that believe the acorns are better on the inside. As a result, the cages must be checked daily for holes. After repairing the same patches over and over, it has been realized that the squirrels came through the same places most of the time and the holes are usually small. These holes can be left but must be watched closely for any enlargement which would enable a bird to escape. Possibly, if the cages had not been built so close to tall trees there would be less of a squirrel problem. Another disadvantage is, again, that the netting has a life of only about five years and, therefore, may not be practical for extended use, due to replacement cost and inconvenience.

The nylon netting has probably saved several nervous birds from injury at the Dallas Zoo. Although maintenance is somewhat labor-intensive, requiring two keepers and a 20-foot extension ladder to repair squirrel holes, the cages have been successful for their intended temporary use since their completion in 1984. It is yet to be determined if this netting will be used again at the Dallas Zoo. The pros and cons will have to be carefully weighed before a final decision can be made.

Suppliers of the netting:

1. West Coast Netting, Inc.
8978 Haven Avenue
Rancho Cucamonga, CA 91730
2. Sterling Net and Twine Co., Inc.
Montclair, NJ 07042



Chapter News

Tucson AAZK Chapter

At the March annual meeting of the Tucson AAZK Chapter the following individuals were elected to office:

President.....Kerry Hoffman
Vice President.....Jill Hickey
Secretary.....George Montgomery
Treasurer.....Ed Hansen
Officers-at-large.....Vicky Norwood and
Karen Bongrantz (Chapter Liaison)

Our Chapter is busy planning for the 1988 AAZK National Conference, a coinciding conference with the Association of Zoological Horticulture (AZH). We are involved in fund-raising projects and continuing our monthly meetings with frequent slide shows. Our member Rusty Agte is regularly sending correspondence to our sponsored Indian Keeper, Mr. Babubai of the Hill Garden Zoo, Ahmedabad, India.

---George Montgomery, Sec'y

Bronx Zoo AAZK Chapter

On 3 April the Bronx Zoo Chapter held elections for the coming year. The new officers are:

President.....John Kiseda
Vice President.....Pam Orsi
Treasurer.....Bob Edington
In House Sec'y.....Linda Lavero
Corresponding Sec'y.....Mark Hofling

---Mark Hofling, Corres. Sec'y

Rocky Mountain AAZK Chapter

Officers for the Rocky Mountain AAZK Chapter (Denver Zoological Gardens) are:

President.....Denny Roling
Vice President.....Dottie Kreider
Secretary.....John Turner
Treasurer.....Brittain Thompson
Corres. Sec'y.....Ann Rademacher

The Chapter holds monthly business meetings and attempts to have a speaker at each of these meetings. Their fundraisers currently include two annual garage sales.

Mesker Park Zoo AAZK Chapter

Officers for the Chapter located in Evansville, IN are:

President.....Pamela Rogers
Vice President.....James Evans
Secretary.....Jayne Wolf
Treasurer.....Karen Brown
Chapter Liaison.....Lynn Gries
Sgt-at-Arms/Parliamentarian
...Shawn Devoy

This Chapter was reorganized and reactivated in January of this year and National AAZK welcomes them back and wishes them much success in their projects and programs.

Zoo Atlanta AAZK Chapter

Zoo Atlanta AAZK is gearing up for our spring fundraisers with T-shirt sales. We have also decided to sponsor our adopted Indian Keeper, Pundareeka Rao's courses of study with the National Education Council at a cost of \$135.00. We urge all other chapters with adopted keepers to consider doing the same.

---Tim Kurkowski, Chapter Liaison

CHAPTER NEWS

Continued

Assiniboine Park Zoo Keepers Assoc.

Newly elected officers from the Chapter in Winnipeg, Manitoba, Canada are:

President.....Mark de Denus
Vice President.....Tim Kelly
Secretary.....Nancy King
Treasurer.....Janice Martin
Chapter Liaison.....Bob Debets

The Chapter is currently participating in National Wildlife Week. This involved planning a display and manning it for a week in one of the major shopping centers in Winnipeg. The theme this year was Native Canadian Wildlife.

The Chapter is also setting a budget for the current year. This budget will have a number of categories in it. Some examples are: funding for research projects by Professional Chapter members; purchasing books for the zoo library; and monies made available to assist members in attending various work-related conferences and courses (registrations). There will also be an area in the budget for various funds to be donated to conservation groups such as World Wildlife Fund, on an annual basis.

The 12th National Conference Committee has completed its report. It has been forwarded to National along with a check in the amount of \$5518.29 Cdn. This represents National's share of the profits from the '86 conference.

---*Bob Debets, Chapter Liaison*

South Florida AAZK Chapter

The South Florida AAZK Chapter held a fundraiser benefitting the Orangutan Project in Kalimantan, Borneo. A total of \$500.00 raised through the efforts of the SFAAZK Chapter, the Zoological Society of Florida, the Dreher Park Zoo, and individual donors was presented to Dr. Birute Galdikas, Ph. D., at the end of her lecture. This was the first lecture presented, through the Zoological Society's Education Department, by a field biologist to an audience which included zoo staff, society members, Earth Watch members, and zoo patrons. The Chapter members involved with this fundraiser were proud of the efforts of the Metrozoo and the Zoological Society of Florida for making the event possible.

---*Rachel Rogers, President*

Newsletters keep Chapters up-to-date

Several AAZK Chapter have established their own Chapter Newsletters to keep members aware of their activities and projects. San Diego and the Greater San Francisco Bay Area Chapters both produce fine newsletters and have been gracious enough to include AAZK National on their distribution list. We are sure there are other chapters out there who have local newsletters. We would like to hear from you and if possible be included on your distribution list.

Other Notes

We are also collecting samples of Chapter logos to have on file at National HQ. This helps us out if a chapter inquires about what species are already being used on chapter logos and helps to avoid duplication. If you have not already sent National a sample of your Chapter logo, please do so. A piece of letterhead, patch or anything with the logo on it will do. We appreciate your help in keeping our Chapter Logo file up-to-date.

Thank you to the many Chapter who have sent in their Chapter Information Forms. Please remember to keep this under Chapter News.

If your Chapter has not as yet appointed a Chapter Liaison, please do so ASAP. We hope having such a liaison at each Chapter will make it easier for us to keep local Chapters aware of National projects and programs. Chapter Liaison Packets have been put together by AAZK President Jean Hromadka and are currently being distributed to Chapters who have named a Liaison. If you have not yet received your packet, please contact Jean. The Chapter Liaison Packet contains much useful information on AAZK, its projects and programs and should aid in answering questions Chapters often have concerning National's activities.

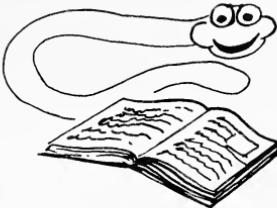
---*AKF Staff*



Book Review

Eastern Chipmunks. Secrets of Their Solitary Lives

By Dr. Lawrence Wishner
Smithsonian Institution Press, 1982
Washington, DC
144 pages, \$17.50 hardback



Review by Karin Newman
Milwaukee, Wisconsin

The behavior and life history of the Eastern Chipmunk, *Tamias striatus*, is delightfully presented by Dr. Wishner, who studied a small population of E. chipmunk on 1.5 acres of land in Spotsylvania County, Virginia. Dr. Wishner's information stems from four or five hours of daily observation of the study group of chipmunks over a six-year period. The book is packed with information about this solitary member of the squirrel family. The first chapter deals with general life history such as the chipmunk's diurnal activity patterns and its burrowing and food-hoarding habits. Dr. Wishner then goes into the evolution of the chipmunk and uses illustrations to diagram the relationship of the chipmunk with true tree squirrels (*Sciurus*) and ground squirrels (*Spermophilus*) as they evolved from the Oligocene period (40 million years ago) to the present.

In the next seven chapters, the reader is introduced to the individual chipmunk characters that Dr. Wishner became familiar with in his study. Through the antics of Lady Cheltenham, Guilford, Fenwick, Hannibal, Mistress Earwicker, and the other study chipmunks with equally fanciful names, the reader learns about such aspects of chipmunk life as reproductive behavior, family and social interactions (or the lack thereof), burrow construction, territoriality and vocalizations. Dr. Wishner's style of writing is light-hearted and, although his use of anthropomorphic description at times is distracting, in general the text is very informative as well as entertaining.

Numerous beautiful color and black and white photographs enhance the text and the appendices at the end of the book catalog specific behaviors, taxonomic history and description, and biographical sketches of some of the more prominent members of the chipmunk study group.

Chipmunks have adjusted to living in close contact with man and their antics delight wildlife observers throughout their range. However, very few long-term studies have been conducted of these secretive rodents in the wild. Thus, *Eastern Chipmunks* answers some of the questions regarding *Tamias striatus* and is a good reference for naturalists, biologists, or animal lovers with chipmunks in their backyards.



Information Please

Anyone having any information on the artificial insemination of reptiles please send a copy of the article or a citation of the literature to: Ken Kundel at the Virginia Zoological Park, 3500 Granby St., Norfolk, VA 23504. Your cooperation in this matter is greatly needed and appreciated.

AAZPA Professional Management School

By
Gail Bruner, Keeper
Los Angeles Zoo
Los Angeles, CA

Every February, the Pittsburgh airport hums with talk of, "we hired this contractor to make our fake trees"; "if we can't get them to breed, we might have to artificially inseminate"; "our fund-raising campaign was successful in raising the \$8 million we need for the new swamp exhibit..." The bystander turns his head to listen -- who are these people?

They are students bound for Oglebay Park in Wheeling, West Virginia. They have come for five days of grueling classwork, enlightening talk, and hopefully (if there is time), a little R&R. Their goal is to attend and successfully complete the two-year "School for Professional Management Development for Zoo and Aquarium Personnel".

The Management School was organized thirteen years ago by the AAZPA and North Carolina State University to take zoo and aquarium managers, who have primarily biologically-oriented backgrounds, and make them better administrators. Its purpose is to develop and sharpen administrative skill through a better understanding of management principles and their practical application.

One look at the two-inch binder of reading material mailed a month in advance, and one quickly realizes that this is not an easy course. The first-year students gabble with nervous anticipation as the limousine service pulls slowly up to Wilson Lodge. Formerly a private riding lodge, it is now a modern, but quaint, hotel set atop one of the many rolling hills that make up the 1500-acre park. The second-year students gaze wistfully at the slopes. Will the skiing be good this year? Are the golf courses open? Are the horseback-riding trails in good condition? Have I read and studied all my material so I can squeeze in the time to do these things?

Sunday night--registration, orientation, the first class session, and finally a social hour are scheduled for the evening. Four more days lay ahead of 8:30-5:00 class sessions covering sixteen topics the first year and twenty (different) topics the second year. The "dreaded" test comes on Thursday, with a graduation banquet following (at least one *hopes* it is a graduation banquet).

Monday morning, 7:30 a.m., breakfast--the flock of students gather with subdued excitement in the dining room. The 'first-years' gaze questioningly at the one hundred unknown faces before them, while fifty familiar faces of the former 'first years' answer with smiles of recognition.

The bell sounds and a rush of feet is heard as the first and second-year students file into their respective conference rooms. The second-year student looks at his agenda. First class of the day: "Motivation--How to Develop Job Pride." Motivation on a Monday morning, how challenging! The instructor knows his task and with the help of a few jokes and historical examples, the topic is successfully conveyed. The hour ends.

For fifteen minutes between classes all students and instructors mingle around the coffee table. A director from Memphis says hello; a curator from New Orleans replies; a keeper from New York joins in. Ideas and techniques are compared, criticized, and collected; contacts are established, and a murmur of "we'll continue this later..." is heard as the bell rings for the next class.

The second-year student's day continues with "Legislation affecting Zoos and Aquariums", "Volunteers", "Marketing and Consumer Research", "Interviewing Techniques", and "Director-Board Relationships". The first-year students decipher the "Concepts of Management", "Budget Development", "Community Relationships", "Revenue Producing Activities", and "Effective Communications".

AAZPA Professional Management School, Continued

Lunchtime is consumed with study or discussion, as it becomes increasingly clear that the blizzard of last week has subsided, and confined the mounds of snow to the roadside and not the slopes. Evening continues as a study period for the first-year students, while the second-year students (who, after all, have passed the first year, so how hard can the test be second year?) spend their time renewing acquaintances and year-old debates in the Glassworks. Zoo policies, animal transactions, exhibit designs, and management principles learned that day are pursued on cocktail napkins. Ranks are laid aside by instructors and pupils as the hours tick by. Talk turns to the next day's classes, and the Glassworks slowly empties for sleep.

Three days follow, jam-packed with diversified courses, and the air becomes charged with "finals week" cramming and wonder. Wednesday afternoon is left free for review of the sixteen hours of lecture, the two-inch binder of readings, and postulation of the five hours of lecture to come. An obligatory visit to the AAZPA headquarters and Robert Wagner's office is accomplished and then it's back to the books.

Thursday dawns with the thought of "I either know these management skills by now or I don't", and a sense of calm pervades the day's lectures. The students enter with confidence to take the test, and emerge ready to celebrate at the evening's banquet. The week at Oglebay has brought new friends, new ideas and concepts, and an understanding of the complexity of management.

The Pittsburgh airport hums with "zoo-talk" mixed with "business-talk". The bystander turns his head to listen, then walks on. The graduates disperse continent-wide, returning to their zoos and aquariums as better managers and business men and women.



Keeper's Alert

(In the January 1987 issue of AKF, the Public Education Committee solicited answers from the membership on questions frequently asked by zoo visitors. The committee is seeking the "best" answers to such questions to incorporate in a booklet. The following is the first question restated and the answers received by the committee. A second frequently asked question will appear at the end of this article--please take a few minutes and put your thoughts together and send them to Ellen Bradfield at the address given. Your input is needed!)

Question # 1 was: "Are they tame?"

Thanks to Brandy Pound, Steven Wing, Donna FitzRoy Hardy, Dorothea B. Jackson, Lauren Ellison, Tenna Carlson, Jessica Fox, Laurie Thomas, and all the folks from Winnipeg for their input.

The answer to Question #1 is:

Although many zoo animals appear calm or "tame", it is simply because they've become accustomed to the presence of people. All animals (even those that have been domesticated) are potentially dangerous and unpredictable. However, some zoos do have "contact areas" or "petting zoos". Please check with zoo personnel and read all signs before assuming that an animal is safe to approach.

Answers to questions in this column will ideally address the issue in a complete and concise manner. Any and all input is welcomed.

Question # 2 is: "Why do zoos exist?"

Send all input to: *Ellen Bradfield, Zoo Atlanta AAZK, 800 Cherokee Ave. S.E., Atlanta, GA 30315.*



A Method of Predicting Births in Small Antelope

By

David Luce, Mammal Keeper
Dallas Zoo, Dallas, TX

In July of 1966 the Dallas Zoo embarked upon a program which would make it one of the leading zoos in the field of small antelope husbandry and management. It was at this time that the Dallas Zoo acquired the first of four species of small antelope it now exhibits: Guenther's dik dik (*Madoqua guentheri smithi*), Kirk's dik dik (*Madoqua kirkii*), Klipspringer (*Oreotragus oreotragus*) and Suni (*Neotragus moschatus zuluensis*).

Since the arrival of Kirk's dik dik in 1966, the Dallas Zoo has had a total of 230 small antelope births (Guenther's dik dik 4, Kirk's dik dik 54, Klipspringer 37, and Suni 135).

In caring for these animals the question arises, how does one predict with a fair degree of accuracy when an individual will give birth? At present there is very little information on any of the four species with regard to gestation periods.

One possible method, which will be explored in this paper, is to calculate the average number of days from birth of one calf to the birth of the next calf. Based upon this data it may be possible to predict when the next calf is likely to be born. This paper presents baseline data on birth intervals for Kirk's dik dik, Klipspringer and Suni.

Methods

The collection of data for birth intervals consisted of noting, from the records, the dates each female gave birth and calculating the number of days between births. Births greater than 10 months or roughly 1.5 times the recorded gestation periods were eliminated. The total for each species was tabulated and the means, medians and standard errors were calculated. The Student's T-test was performed on the data to test for randomness.

Results

Of the 230 total small antelope births only 140 (61%) were used (90 births were calculated to be intervals greater than 10 months or for females which gave birth only once). Table 1 summarizes the data.

TABLE 1 - Gestation periods and birth intervals for 3 small antelope species.

Species	Gestation*	Mean Birth Interval	Birth Interval S.E.	Birth Interval Range
Kirk's dik dik <i>Madoqua kirkii</i>	180 days	198 days	30 days	163-268 days
Klipspringer <i>Oreotragus oreotragus</i>	210-214 days	238 days	24 days	190-292 days
Suni <i>Neotragus moschatus zuluensis</i>	180 days	238 days	30 days	208-323 days

*Literature values

A Method of Predicting Births in Small Antelope, Continued

Of the three species evaluated, Kirk's dik dik had the shortest birth interval with a mean of 198 days or roughly 6.6 months (calculated from a total of 43 births from 5 females resulting in 34 birth intervals). The standard error (S.E.) was 30 days and the length of birth intervals ranged from 163 to 268 days with a median of 221 days.

Both Klipspringer and Suni had birth intervals of 238 days or roughly 8 months. The Klipspringer birth intervals were calculated from 34 births from 4 females resulting in 26 birth intervals which ranged from 190 to 292 days with a median of 241 days and a standard error of 24 days. There were 62 Suni births from 14 females which resulted in 43 birth intervals. The range was from 208 to 323 days with a median of 264 days and a standard error of 30 days.

The Student's T-test yielded values of less than 0.005 for all three species when the data collected was compared with literature values for gestation periods.

Guenther's dik dik were not used since the sample size of 4 births would have resulted in only 2 birth intervals.

Discussion

When gestation periods listed in the literature (Brainard, Kingdon, McDonald and Walker) are compared with the average birth intervals we find that in two species, Kirk's dik dik and Klipspringer, the differences between the two fall within the standard error and vary slightly from the mean birth intervals. Suni, on the other hand, have a difference between birth interval and gestation period of around 2 times the standard error. The Student's T-test values indicated that there is less than a 1% chance that these differences are due to random chance and that these differences are significant. This may indicate that both Kirk's dik dik and Klipspringer begin their reproductive cycling soon after giving birth whereas Suni seem to be cycling or becoming pregnant roughly two months after giving birth. Though our records only go as far back as 1979, the absence of males does not seem to be a factor in the extended birth intervals for Suni. The records from 1979 on indicate that males were present for breeding at all times.

How does one explain the difference? Could it be that the estimated gestation period which appears in the literature is incorrect? When individual birth intervals are compared with the gestation periods found in the literature we find that 50% or more of the Kirk's dik dik and Klipspringer birth intervals fall within the literature values for gestation periods or are very close (+/- 1 week), refer to Table 1. In Suni not one of the birth intervals falls within or near (+/- 1 week) the gestation periods found in the literature, refer to Table 1. This may indicate or suggest that the literature values on Kirk's dik dik and Klipspringers is accurate due to the proximity of birth intervals to the estimated gestation periods. If as Kingdon states "the female appears to have a post-partum oestrus..." the literature on Suni gestation periods may need to be revised as the gestation period may be somewhat closer to seven months than to the six month period that is presently cited in the literature. When a seven month gestation period is used to compare individual birth intervals and gestation periods we find that 42% of the birth intervals fall within or near the gestation period, refer to Table 1.

Though this technique may not provide us with a precise date or time in which an animal may give birth, it does allow us to predict when a birth is likely to occur (when breeding dates are not available) based upon previous birth intervals.

Conclusions

- 1) Kirk's dik dik have a birth interval of 198 days or 6.6 months.
- 2) Klipspringer and Suni birth intervals are 238 days or 8 months.
- 3) Kirk's dik dik and Klipspringer may start cycling soon after calving.
- 4) Suni may have a gestation period longer than that recorded in the literature.

A Method of Predicting Births in Small Antelope, Continued

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Interest Groups Forming

Cheetah Interest Group

The time has come! The knowledge and experience of cheetah keepers and enthusiasts will be the basis for the Cheetah Interest Group now forming. This group will provide an additional source of information on cheetah husbandry, breeding management and strategies and hand-rearing techniques. Other points of interest, felt to be valuable information by you, will also be welcomed.

Newsletters and an annual conference are planned and will be based on your input. Interested? Please contact: *Adrian Haft, Louisville Zoo, P.O. Box 37250, Louisville, KY 40233. Phone: (502) 459-2181.*

Felid Research & Conservation Interest Group

I would like to organize an interest group whose purpose would be to share information from conferences, symposia, and ongoing research among individuals interested in felid research and conservation. Additional activities could be the generation of a felid and felid-related bibliography, a periodic literature update, a quarterly newsletter, and a directory of interested individuals. If you have a sincere interest in participating in such a group, please send a self-addressed, stamped envelope to: *Gail E. Foreman, Department of Zoology, OSU, 1735 Neil Ave., Columbus, OH 43210.*

Wildlife Preservation Trust International

Training Program

Purpose: To train individuals in the techniques of captive breeding of a variety of endangered animal species so that they can advance the cause of wildlife preservation in their respective countries.

Background: The Wildlife Preservation Trust is an international non-profit organization dedicated to the support of captive breeding of endangered species. It supports projects in captive breeding, field surveys, reintroduction, research and education. The zoological facility for the Trust's work is located on the island of Jersey, Channel Islands, British Isles. This facility is both a zoo and breeding/research facility for endangered species, and has a collection of over 100 species of birds, mammals and reptiles. The International Training Center is an educational facility for training in captive breeding and species conservation; it combines dormitory, classroom and research facilities for students, staff and visiting scientists.

Program: The training program consists of 16, 10 or 6 weeks of intensive work in all divisions of the zoo. Trainees work in close contact with zoo staff in all phases of animal keeping and breeding. Each trainee spends two weeks in each section and a final two weeks on an independent project. Daily duties are supplemented with weekly seminars on a variety of topics. The program is flexible in terms of length and focus.

Eligibility: The program is designed for individuals with previous practical experience with animals: zoo and animal center staff and postgraduates in conservation-related fields.

Application: Applications may be obtained from the address below. Selection is made in August of each year. Applications should be submitted by 1 June for training beginning in the following year.

Dates: Starting date is by arrangement.

Location: Jersey Island, Channel Islands, British Isles

Fees: Tuition is £75 (approximately \$113). Full room and board costs are £65 (approximately \$98) per week. Trainees are responsible for air fare to and from Jersey, Channel Islands, as well as personal expenses.

For application and further information write or call:

Training Program
Wildlife Preservation Trust International
34th Street and Girard Avenue
Philadelphia, PA 19104

Telephone (215) 222-3636

DEADLINE FOR APPLICATION FOR 1988 POSITIONS IS JUNE 1ST, 1987



Institutions wishing to advertise employment opportunities are asked to send pertinent data by the 15th of each month to: Opportunity Knocks/AKE, 635 Gage Blvd., Topeka, KS 66606. Please include closing dates for positions available. There is no charge for this service and phone-in listings of positions which become available close to deadline are accepted.

VETERINARY TECHNICIANWorld Famous Topeka Zoo. \$5.34 - \$6.41/hr. Performs the many laboratory tests in the Animal Health Center used to assist the Zoo Veterinarian in diagnosing and treating the animals. These tests involve skill in: complete blood counts, performing parasite checks, urinalysis and heart worm tests, use and care of laboratory and medical equipment. Assist in surgical and immobilization procedures, restock medicines and supplies. Feed, care and provide treatment for animals. Assist in the maintenance of animal medical records and other reports or paperwork. REQUIREMENTS: Must be a graduate of an American Veterinary Medical Association accredited program in Animal Technology. Must be either registered or eligible for Kansas registration. Prefer clinical experience in a veterinary practice or zoo veterinary program. Apply through 5/22/87. Send resume to: City of Topeka, Personnel Division, P.O. Box 1996, Topeka, KS 66601. EOE/M/F/H.

CURATOR IThe Wildlife Discovery Program (a Houston I.S.D. Magnet School) is now taking applications for the 1987-1988 school year. The Curator I position will become available in August of '87 and continue until June of '88 (a 10-month contract). The duties of this position include planning and experiential instruction in an outdoor setting at the Houston Zoo to 3rd graders. Requirements are two or more of the following: 1) high school diploma (required); 2) education experience; 3) wildlife biology background; 4) environmental/outdoor education experience. Applications will be accepted until 15 June, 1987. Please send inquiries to: Ms. Karyl Watz, Coordinator, Wildlife Discovery Program, 1513 Outer Belt Drive, Houston, TX 77030.

REPTILE/AMPHIBIAN KEEPER....requires experience with a variety of domestic and exotic species. Public speaking abilities are required. BS in zoology or related field preferable, experience can substitute. Salary: \$14,556-\$19,536 plus benefits. Send copies of curriculum vitae to: Lyndon A. Mitchell, Supervisor, Dallas Zoo, 621 East Clarendon Drive, Dallas, TX 75203 and City of Dallas Personnel Department, 1500 Marilla, 6th Floor, Dallas, TX 75201.

AMAZON INTERNSHIPS....work-study at a field station 80 miles deep in climax tropical rainforest, Peru. Specialities include: rehabilitation, reintroduction of wildlife confiscated from the illegal pet trade; nature photography, field study. Must pay airfare, tuition, room and board. Contact: Amazon Conservation Foundation, 18328 Gulf Blvd., Indian Shores, FL 33535.

Last Wild California Condor Captured



On 19 April 1987, the last free-living California Condor (*Gymnogyps californianus*) was captured by wildlife biologists who hope that man's intervention may help to someday repopulate the Southern California skies with this critically endangered species. The male bird was taken from the Bitter Creek National Wildlife Refuge in the foothills of Kern County near Bakersfield to the San Diego Wild Animal Park in Escondido. He joins 27 previously captured or captively-hatched members of his species in a captive breeding program being jointly conducted by the San Diego Wild Animal Park and the Los Angeles Zoo.

The seven-year-old male, officially known as AC-9, was not only the last condor to be removed from the wild, but was also the first such bird ever handled by the research and trapping teams when they began a monitoring program in 1980. AC-9 has been closely observed since that time.

If captive breeding proves successful, scientists are hopeful of being able to release condors back into the wild over the next decade. Until such a time, the skies of this region will be bereft of the sight of the condor's magnificent nine-foot wingspan as it soars on the rising thermals. After surviving for 15,000 years in this habitat, the California condor's ultimate fate now lies with the determination and dedication of all those involved in the California Condor Recovery Project.



AAZK Membership Application

Name _____ Check here if renewal []

Address _____

____ \$25.00 Professional <i>Full-time Keepers</i>	____ \$20.00 Affiliate <i>Other staff & volunteers</i>
____ \$25.00 International <i>All members outside the U.S. & Canada</i>	____ \$15.00 Associate <i>Those not connected with an animal facility</i>
____ \$15.00 Library <i>Library subscription only</i>	____ \$50.00 Contributing <i>Organizations and Individuals</i>

Directory Information: Zoo: _____

Work Area: _____ Special Interests: _____

Mail this application and check or money order (U.S. CURRENCY ONLY PLEASE), payable to American Association of Zoo Keepers, Inc., to: AAZK National Headquarters, Topeka Zoo, 635 Gage Blvd., Topeka, KS 66606.

Membership includes a subscription to *Animal Keepers' Forum*. The membership card is good for free admission to many zoos and aquariums in the U.S. and Canada.

INFORMATION FOR CONTRIBUTORS

Animal Keepers' Forum publishes original papers and news items of interest to the Animal Keeping profession. Non-members are welcome to submit articles for consideration.

Articles should be typed or hand-printed. All illustrations, graphs and tables should be clearly marked, in final form, and should fit in a page size no more than 6" x 10" (15cm x 25 1/2cm). Literature used should be cited in the text and in final bibliography. Avoid footnotes. Include scientific name of species the first time it is used. Thereafter use common name. Black and white photos only accepted.

Articles sent to *Animal Keepers' Forum* will be reviewed for publication. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Those longer than three pages may be separated into monthly installments at the discretion of the editorial staff. The editors reserve the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed envelope. Telephone contributions on late-breaking news or last-minute insertions are accepted. However, phone-in contributions of long articles will not be accepted. The phone number is (913) 272-5821 Ext. 31.

DEADLINE FOR EACH EDITION IS THE 15TH OF THE PRECEDING MONTH

*Articles printed do not necessarily reflect the
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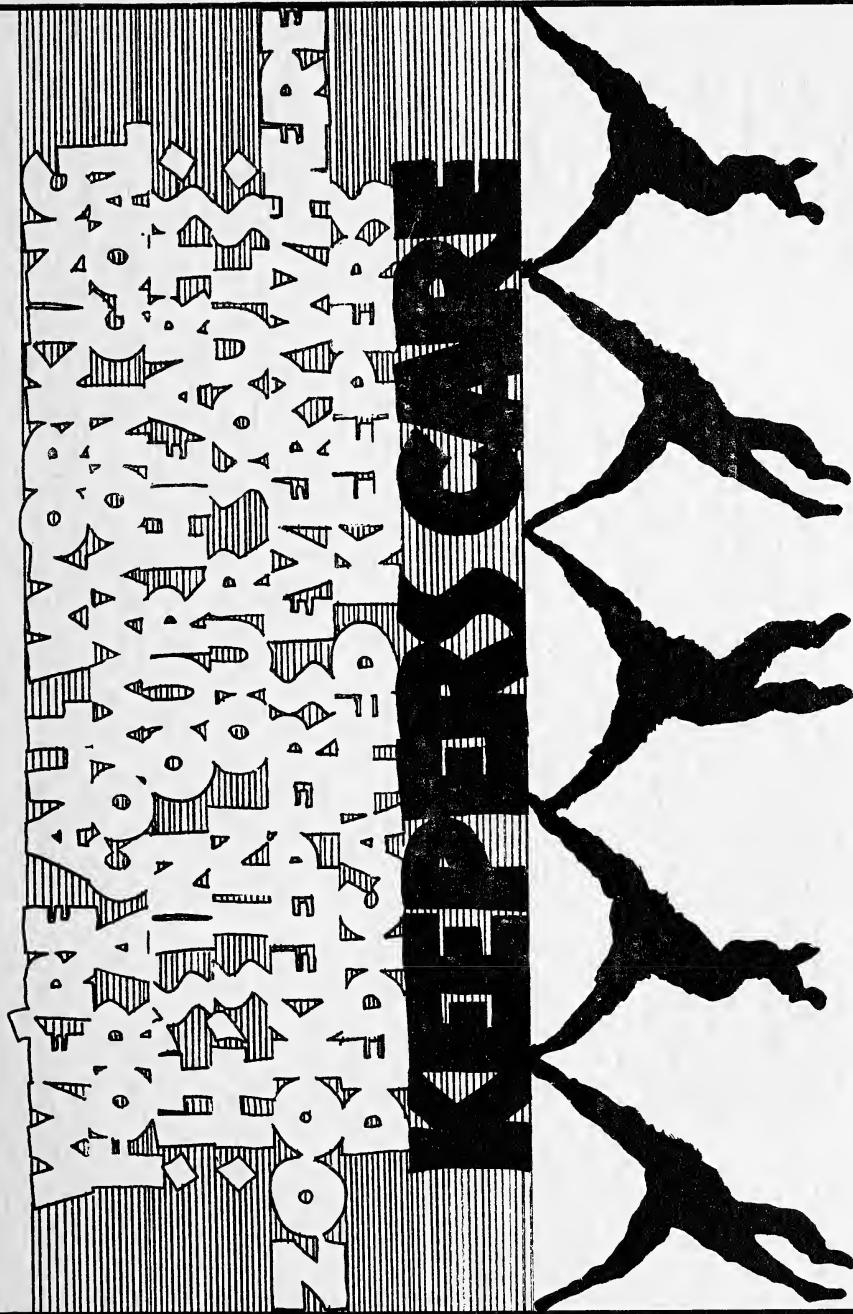


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June 1987

Animal Keepers' Forum

LYRICS BY O'CAFFEY LETTERS BY LESLIE ANN SC



ANIMAL KEEPERS' FORUM, 635 Gage Blvd., Topeka, KS 66606

Executive Editor: Alice Miser
Managing Editor: Susan Chan
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June 1987
Volume Fourteen
Number Six

Animal Keepers' Forum (ISSN 0164-9531) is a monthly journal of the American Association of Zoo Keepers, Inc., 635 Gage Blvd., Topeka, KS 66606. Five dollars of each membership fee goes toward annual publication costs of Animal Keepers' Forum. Second Class postage paid at Topeka, KS. Postmaster: Please send address changes to:

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Individual Regional Coordinators and the states under their oversight are listed elsewhere in each issue of AKF.

This month's cover art was designed by Leslie-Ann Drummond, Acting Keeper at the Calgary Zoo, Calgary, Alberta, Canada. The design, featuring the lyrics of AAZK's "official songwriter" Oliver Claffey, Metro Toronto Zoo, was so unique we didn't want to have to reduce it down to fit a standard AKF cover format, so we opted to run it vertically at nearly 100% original size. We could think of no more fitting way to honor National Zoo and Aquarium Month than to feature Leslie's cover art which expresses the feelings of professional keepers everywhere. Thanks, Leslie-Ann and Ollie!

SCOOPS AND SCUTTLEBUTT

Bids for 1989 AAZK National Conference Now Being Accepted

To all AAZK Chapters:

Bids for the 1989 National AAZK Conference may be submitted any time prior to the 1987 National Conference in Milwaukee. Any chapter may submit a bid for the national conference or a regional conference. As stated in the AAZK By-laws and Constitution, all bids must be approved by the Board of Directors before the chapter may begin advertising the conference.

Bids should include a letter of intent to host the conference from the chapter president. Support letters of approval from the zoo's director as well as from the mayor or other relevant persons or agencies (e.g. zoological society, city council, convention center, etc.) should also be included. The original letters and four copies of each letter should be sent to the AAZK Vice President for distribution to the Board.

The Board of Directors serves the AAZK membership to advise local chapters about conference plans. The Board's experience with national and regional conferences is tapped to give conference planners the best opportunity for a successful conference. The Conference Book Committee provides a complete outline and summary of conference planning.

National Conference bid presentations are made at the annual national conference. If two or more chapters bid for a national conference, the attending membership will vote on the site following bid presentation early in the national conference.

Questions about procedure or planning should be directed to Phil Pennock, Conference Book Committee Chairman or the current AAZK Vice President.

A Report on the Membership Directory from Pat Sammarco

The AAZK Board has decided that the Membership Directory will be published biannually and will, from this point forward, take advantage of the computer at National Headquarters to produce it. This year will be the first year skipped in the new plan.

It has been a great deal of work producing the Directory in the past, but just as in our profession, has been exciting and satisfying. Special thanks go to typographer Rick Ruth who has been providing the expertise and facilities to have the book artfully typeset at a more than reasonable, actually cheap, price. Rick has also shown his support of AAZK by maintaining a Contributing membership.

In the past, memberships have been handled at National Headquarters at the World Famous Topeka Zoo by Barbara Manspeaker, who forwarded directory information to Pat Sammarco. Pat entered, or rearranged, or corrected, or added to each member's file card as members joined, moved, changed their listings, or let memberships expire. Interesting facts became apparent

Scoops and Scuttlebutt, Continued

when handling this information. Keepers are nomads, some with as many as five or six address changes per year. Keepers change runs and zoos fairly often, and occasionally get promoted. Associate members become Keepers. Some Keepers even form pairs.

It will be difficult to part with all this insight into fellow Keepers' lives. However, getting rid of the 36 inches worth of file cards, and the three file boxes it takes to hold them will certainly give me more desk space.

Entering the information that members provided was a matter of going to RTP Graphics, Rick's office, and assisting Rick, or doing some of the keyboarding to enter, change and delete information stored on discs, using a computerized typesetting machine. At production time, the final entries would be made, then Rick would format all the pages, and we would update the special pages that guide members to administrators, projects and legends to the book. All the cards would then be marked as to the page of entry, reshuffled into alphabetical order, and another couple trips to Rick would have the index set.

The computer system at National Headquarters should now be able to handle the Membership Directory, with little loss of quality and a lot less mailing.

I appreciate all the help that all the members have given over the years in adding their interests and work areas to the other statistics entered in the Directory. I feel that we will continue to have a good guide to communicating with each other directly in professional matters.

(From the AAZK Board of Directors: There is no possible way the Association can thank Pat Sammarco for her tireless efforts in producing the Membership Directory over the past years. Her dedication to the profession of zookeeping was tested many times by last-minute entries and corrections, many late-night wrap-up sessions, unexpected delays in production and the accompanying hassles and frustrations. To Pat, on behalf of the entire AAZK membership, our sincere thanks and gratitude for a job well done)

Important Diet Note Book Address Change - Please Take Note!

Garret Glodek, Coordinator for the collection of Fish diets for the upcoming AAZK Diet Notebook has moved to a new facility and those wishing to submit fish diets should take note of the new address. Garret is no longer at the South Florida Aquarium but has moved to the Point Defiance Zoo & Aquarium, North 54th and North Pearl, Tacoma, WA 98328. Please send all Fish diet information to Garret at the Point Defiance address.

Coordinators for other sections of the Diet Notebook are as follows: Mammals: Susan Bunn, Minnesota Zoological Garden, 12101 Johnny Cake Ridge Road, Apple Valley, MN 55124; Birds: Kelly Westbrook, Little Rock Zoological Garden, #1 Jonesboro Dr., Little Rock, AR 72205; Reptiles: Brint Spencer, Minnesota Zoological Gardens (addresss above); Invertebrates: Susan Kenney, John G. Shedd Aquarium, 1200 South Lake Shore Dr., Chicago, IL 60605.

The Diet Notebook Committee hopes to have the publication available by the Milwaukee Conference, so if you haven't sent in your diets to be included in this reference work, Do So Now!



Editorial Comment

A hearty congratulations to AAZK Historian Art Goodrich and all those keepers from the San Diego Zoo, San Diego Wild Animal Park and Sea World who helped make the AAZK's 20th Anniversary Founder's Weekend such a wonderful event! Approximately 140 keepers gathered from May 5th to 8th in beautiful San Diego to honor the founders of our Association. What a great way to kick off AAZK's 20th anniversary year!

The "Weekend" (and all of you keepers know that weekends do not necessarily fall on Saturdays and Sundays!) began with an Icebreaker on Tuesday evening, complete with a highly successful Chinese Auction and a 50's and 60's Disco Dance. Wednesday and Thursday found the delegates split into groups for visits to either the San Diego Zoo or the Wild Animal Park. Workshops on Zoonotic Diseases, Pathology, Reptiles, Condors and Cranes and "Teaching the Touch" with Linda Tellington-Jones offered attendees a wide variety of options as to how to spend their days. The weather was beautiful both days for the outside activities and everyone agreed that a great time was had by all!

On Thursday night the Founder's Banquet was held with four of AAZK's founders in attendance: Dick Sweeney, Red Thomas, Ken Willingham and Conrad Grayson. Dennis Melvin was unable to attend and Walt Bromley and Carle Pyle are deceased. Gathered participants enjoyed a sumptuous buffet, heard a keynote address by Dr. Warren Thomas, Director of the Los Angeles Zoo, bid against their peers in a highly successful auction and finally toasted the assembled AAZK founders with champagne. During the program AAZK President Jean Hromadka presented the founders with Distinguished Service Awards, engraved pewter paperweights bearing the rhino logo and AAZK patches encased in lucite. It was a most memorable evening and noting the attendees reluctance to call it a night, it was an evening we all wanted to go on and on. Our pride in AAZK was showing and we wanted to share it with everyone!

Friday dawned clear and sunny and many of the participants opted to remain in San Diego for a post-conference tour of Sea World. The staff at Sea World made all of us feel most welcome and treated us to behind-the-scenes tours of many areas of this unique facility from Penguin Encounter to the off-exhibit Animal Care unit.

The "Weekend", though perhaps more relaxed than a traditional conference, proved once again the existence of that special comradery between dedicated zoo professionals. Shop Talk was plentiful in the Hospitality Room where videotapes included highlights of the Winnipeg ZooOlympics. New friendships were made and past ones renewed.

The "Weekend" went by all too quickly. We all departed to our various destinations with new and greater enthusiasm for our profession and for the Association which brings us together. It is a great beginning to our 20th Anniversary Year and the celebration is sure to continue in this fine tradition at Milwaukee. If you have never attended an AAZK Conference, make 1987 the year to do so -- Join us to celebrate the growth of our Association and in our plans for a future Dedicated to Professional Animal Care. ----S.C.



Births & Hatchings



Scott Carter reports the following from Sedgwick County Zoo, Wichita, KS: In the herpetarium so far this year there have been 9 clutches of oriental firebelly frogs (about 40 froglets), one black and green poison dart froglet, 3 Red-footed tortoises, and 15 Reticulated pythons. SCZ and BG has also been nominated for the Bean Award for breeding Aquatic Caecilians

The Jungle had 0.0.3 capybaras, one acouchi and Golden Lion Tamarin twins on exhibit, as well as hatching 10 Hottentot teal, one NeNe goose, and 2 roul-rouls in the incubators. Pygmy goats are the animal of note in the Farms, with 15 kids produced by our five females, including one set of quintuplets being reared by the mother. Also in the farms, this year marked the first pure karakul lambs (1.2) and 6.6 Ossabaw Island Swine.

The Zoo's first birth of Red Ruffed Lemurs took place in the holding barn with the female producing triplets and proving to be an excellent mother. In Apes and Man a very notable birth occurred on 24 April when "Holly", a chimpanzee on loan from the Denver Zoo, gave birth to her third offspring and surprised everyone by showing excellent maternal care. Her first two infants were rejected at birth. Mother and baby are on exhibit with the group (2.2 adults and 1.1 youngsters). Keepers report that not only is "Holly" caring for the infant, but she has become less of a "loner" with the group.

Besides the usual collared peccaries (1.1), Patagonian Cavies (0.0.3), and Guanacos (2.1) in the Pampas/Outback, this year there have been 9 Darwin's Rheas hatched (4 DNS), 2 Scarlet Macaws, one Lesser Sulfur-crested cockatoo (DNS), one Salmon-crested cockatoo (DNS), one Plush-capped Jay (DNS), 5 Inca Tern (4 DNS) and 4 rainbow lorikeets. The Double-wattled Cassowaries have started laying again, for only the second time, but it is too early to tell how many of the eggs are fertile. All the eggs are being pulled for artificial incubation.

In the Veldt, we had our first second-generation Fringe-eared Oryx, 1.1 (1.0 DNS), and 1.0 Damara Zebra (DNS). The Breeding Farm is very pleased to announce the first White-napped Crane eggs have been laid, and all six are being artificially incubated. The Lappet-faced vultures laid one egg (a first for the Zoo and a rarity in captivity), but unfortunately it proved to be infertile.



Keeper's Alert -

**"Founder's Weekend" Mugs and
T-Shirts Still Available**

For those you who were unable to attend the 20th Anniversary "Founder Weekend" in May, the special commemorative T-Shirts and Coffee Mugs featuring the winning anniversary designs are still available. The coffee mugs are \$5.00 each. The Limited Edition Conference T-shirts are \$15.00 each and the regular Conference T-shirt is available for \$8.00 each. These prices include shipping. Watch next month's AKF when we will publish the winning logo designs from "Founder's Weekend". Orders may be placed through Art Goodrich, Mammal Dept., San Diego Zoo, Box 551, San Diego, CA 92112.

Coming Events

First International Children's Zoo Symposium

July 1-4, 1987

Philadelphia, PA

Symposium will focus on History and Philosophy, Design and Learning, and Animal Collection and Purpose. There will be pre- and post-conference trips to the Bronx and Baltimore Zoos plus much more. Keeper participation is strongly urged. For further information contact: Robert Callahan, Curator of Children's Zoo, Philadelphia Zoo, 34th & Girard, Philadelphia, PA 19104 (215) 243-1100, Ext. 300. The Philadelphia AAZK Chapter will reimburse the \$100 registration fee for a keeper attending this conference. The recipient will be chosen in a random drawing on 1 July.

"Applying Behavioral Research to Zoo Animal Management"

July 18-25, 1987

Seattle, WA

Hosted by the Woodland Park Zoological Gardens. For more information contact: William Karesh, DVM, Animal Health Dept., Woodland Park Zoo, 5500 Phinney Ave. North, Seattle, WA 98103.

The Society for the Study of Amphibians and Reptiles/ Herpetologists League Annual Meeting

August 9-15, 1987

Veracruz, Mexico

Hosted by the Institute of Biology of the National Autonomous University of Mexico. For further information contact: Richard Vogt, Estacion de Biologia Tropical "Los Tuxtlas", Universidad Nacional Autonoma de Mexico, Apart. Post 94, San Andres Tuxtla, Veracruz, Mexico.

Conference on Exotic Animal Husbandry II

August 13-15, 1987

Monroe, LA

To be held at Holidome (Holiday Inn), Hwy. 165 By-pass. For more information contact: R. A. Hahn, Zoological Consortium, Inc., Thurmont, MD 21788 (301) 271-7488.

The Annual Conference of the Association of Zoological Horticulture

August 17-21, 1987

Calgary, Alberta

Held at the Calgary Zoo. For more information contact: Don Peterkin, Horticulturist, Calgary Zoo, Botanical Gardens & Prehistoric Park, Box 3036, Station B, Calgary, Alberta, Canada T2M 4R8 (403) 265-9310 or Ted Kerr, Hort/Grounds, Columbus Zoological Gardens, P.O. Box 400, Powell, OH 43065 (614) 889-9471.

Coming Events, Continued

The 4th International Wildlife Film-makers Symposium

Sept. 23-27, 1987

Bath, Avon, England

For further information contact: Anne Fenton (Symposium Organizer), BKSTS, 547-549 Victoria House, Vernon Place, London WC1B 4DJ, England.

1987 AAZK National Conference

October 4-8, 1987

Milwaukee, WI

Hosted by the Milwaukee Zoo AAZK Chapter. Look for registration/accommodation forms plus other conference information in the tan insert in this issue of AKF. A post-conference trip to visit Chicago's Brookfield and Lincoln Park Zoos and the Shedd Aquarium is planned. Please complete the Post-Conference interest form on Page 147 of the May 1987 issue of AKF and send to Pat Sammarco at Lincoln Park as soon as possible.

The Eight Annual Elephant Management Workshop

November 11-14, 1987

Asheboro, NC

Hosted by the North Carolina Zoological Park. For information and registration packet, contact: Elly Walters, North Carolina Zoological Park, Route 4, Box 83, Asheboro, NC 27203 (919) 879-5606.



Interest Groups Forming

Cheetah Interest Group

The time has come! The knowledge and experience of cheetah keepers and enthusiasts will be the basis for the Cheetah Interest Group now forming. This group will provide an additional source of information on cheetah husbandry, breeding management and strategies and hand-rearing techniques. Other points of interest, felt to be valuable information by you, will also be welcomed.

Newsletters and an annual conference are planned and will be based on your input. Interested? Please contact: *Adrian Haft, Louisville Zoo, P.O. Box 37250, Louisville, KY 40233. Phone: (502) 459-2181.*

Felid Research & Conservation Interest Group

I would like to organize an interest group whose purpose would be to share information from conferences, symposia, and ongoing research among individuals interested in felid research and conservation. Additional activities could be the generation of a felid and felid-related bibliography, a periodic literature update, a quarterly newsletter, and a directory of interested individuals. If you have a sincere interest in participating in such a group, please send a self-addressed, stamped envelope to: *Gail E. Foreman, Department of Zoology, OSU, 1735 Neil Ave., Columbus, OH 43210.*





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International Affairs Committee - Foreign Keeper Sponsorship Program

By

*Pam McDougall and Melba Shields
AAZK International Affairs Co-Directors*

This program was created when one of our international members working in India suggested that individual members or chapters active within the AAZK organization help sponsor the cost of AAZK international membership fees for animal personnel working in Third World countries. These individuals eligible for this program can range from zoo director to veterinarian to zoo keeper to zoo educator or even a volunteer. The only requirement we insist upon is that those individuals who apply must come from an animal facility located in parts of the world where pay is extremely low and conditions are substandard.

International fees to join AAZK are \$25, but since it takes months even if you send our magazine first class, an added \$10-15 to cover air mail cost for one year would help improve the service. To sponsor an Indian keeper would cost \$48 a year and \$36 for a South American keeper. Those individuals or chapters who sponsor someone should also send a variety of educational aides to their adopted keeper and be sure to request information about their responsibilities and a little personal history.

The goal of this program is to help improve the zoos in Third World countries by enhancing the zoo keeping profession by making available to those sponsored a variety of educational aids which present new and improved methods of caring for exotic animals in captivity. We not only learn about foreign zoos but we walk away with a deeper understanding of different cultures. Through our friendly relations we could also help strengthen ties between our different countries.

Once a keeper is adopted, be prepared to renew their membership from one year to the next. We need to continue our support for those less fortunate and try and encourage them to strive for excellence as an animal keeper through the continuous practice of acquiring better zoo keeping skills. We have had a letter from one of the adoptees who sounds very excited to be in the program. It is his enthusiasm which may help to motivate and educate his fellow keepers.

Presently we have eight individuals from three different continents already sponsored by AAZK chapters and individuals located throughout North America. We need to place four more foreign animal people which will probably take little effort to accomplish. Please give serious consideration to becoming a sponsor. If you or your chapter are interested, write one of the IAC co-directors for further information on the program and the keepers on the waiting list.

**Melba Shields - East Coordinator
Territory - Europe, Africa, Mideast and South America**

**Address: Melba Shields, IAC - East
Small Mammal House - DOM
National Zoological Park
Washington, DC 20008**

**Pam McDougall - West Coordinator
Territory - Asia, Australia, New Zealand**

**Address: Pam McDougall, IAC-West
Calgary Zoological Gardens
Box 3036, Station B
Calgary, Alberta
Canada T2M 4R8**



Exhibit Design Checklist

(Editor's note: The mammal keepers at the Toledo Zoo have been given the opportunity to have input into the design phase of a renovation of the facility's old elephant house into a new, modern primate complex (monkeys & prosimians). Senior Mammal Keeper Bruce Clark wrote the following checklist with input from other keepers, staff and guidance from the mentioned literature. Bruce and other Toledo staff members feel the checklist should aid them in determining what the eventual exhibit will involve and how it should function (covering all the bases). It is published here for your reference and information. AKF hopes to receive further reports from Bruce on the renovation and the usefulness of this checklist in avoiding those dreaded "design problems".)

- I. Animal Needs
- II. Keeper/Staff Needs
- III. Public Needs
- IV. Construction Practicality/Feasibility

I. Animal Needs

A. Adequate Space

- 1. Flight distance from public met
- 2. Escape routes (dominant/subordinate interactions)
- 3. Seclusion/retreat areas (from public, staff, other animals)
- 4. Spatial requirements met for adequate social interactions (vertical and horizontal space)
- 5. Natural range or territory size taken into account
- 6. Access to outside (if practical)
- 7. Adequate size of off-exhibit holding areas

B. Correct Animal Numbers

- 1. Sex ratios
- 2. Overall natural group size
- 3. Compatible species (when mixed)

C. Exhibit Correct with Regard to Specific Species

- 1. Substrate (concrete, sand, gravel, bark, rocks, chip, turf, plantings, etc.)
- 2. Furniture (trees, vines, shrubs, logs, etc.)
- 3. Texture (coarse, smooth, etc.)
- 4. Color
- 5. Pools, streams, falls
- 6. Locomotion taken into consideration
- 7. Adequate noise levels
- 8. Pelage grooming sites
- 9. Supplementary heating
- 10. Resting sites (roosts, platforms, etc.)
- 11. Adequate natural cover
- 12. Circadian, lunar, yearly cycles
- 13. Daily habits
- 14. Yearly habits
- 15. Compatibility (with same species, with other non-related species)
- 16. Temperature (daily, yearly)
- 17. Lighting (daily, yearly)
- 18. Humidity (daily, yearly)

Exhibit Design Checklist, Continued

19. Aquatic chemistry (salinity, trace elements, suspended matter, pH, etc.)
20. Consideration for display behaviors (territory, mating, etc.)
21. Planting if appropriate
22. Aestivation and/or hibernaculum facilities

D. Reproduction

1. Denning facilities
2. Maternity considerations
3. Hand-rearing locations and methods
4. Reintroduction of young

E. Diet

1. Specific nutrition
2. Feeding stations (elevated, spaced-out, etc.)
3. Water (location, accessibility, quality, quantity, etc.)
4. Method of feeding
5. Foraging opportunities and types of forage
6. Consideration for natural feeding behavior

F. Animal Safety

1. Avoidance of trauma (slips, falls, entanglements, escapes, drownings, etc.)
2. Consideration for disasters (smoke, fire, electric shock, etc.)
3. Exhibit "substrate" toxicity

II. Public Needs

- A. Education*
- B. Entertainment*
- C. Accessibility
- D. Ease of viewing
- E. Comfort (seating, railing, quiet, etc.)
- F. Naturalistic (real) impression
- G. Sensory stimulation
- H. Location of graphics
- I. Location of interactive exhibits
- J. Adequate space for public
- K. Flow of public
- L. Aesthetics of exhibit and surroundings

*If C-L are accomplished, the others will follow.

III. Keepers and Other Staff Needs

- A. Ease of cleaning
 1. Accessibility
 2. Methods
 3. Routine (times per day, etc.)
 4. Disinfection
 5. Location of (hoses, spigots, doors, locks, etc.)
- B. Transferring of Animals (exhibit to holding, etc.)
 1. Ease of operation
 2. Maneuverability
- C. Introductory Facilities

Exhibit Design Checklist. *Continued*

D. Adequate Off-Exhibit Holding

E. Keeper Safety

F. Veterinary Care

1. Squeeze facilities
2. Nursery facilities
3. Maternity facilities
4. Quarantine facilities
5. Parasite control
6. Disease transmission problems

G. Adequate Animal Viewing by Keepers

H. Research Viewing

I. Sufficient Work Space

1. Kitchen facilities adequate
2. Methods and storage of animal records

J. Storage Space

1. Tools
2. Feeds

K. Adequate Drainage

L. Wate Removal

M. Animal Escape Proofing and Containment

N. Method for Individual Animal Recognition

O. Feeding Methods

1. Accessibility to feed/forage sites
2. Methods (feeding intervals, locations, techniques, etc.)

P. Manpower Requirements (number of keeper hours per day, etc.)

Q. Consideration for Time Saving Ideas

R. Consideration to Physical Qualities of Keepers (size, strength, etc.)

IV. Construction

A. Practicality

B. Feasibility

1. Cost (initial investment plus additional long-term expenses)
2. Available materials
3. Wearing ability/longevity

C. Correct Barriers (size, construction, strength, layout, materials, etc.)

D. Keeper Maintenance Considerations

E. Maintenance Upkeep Considerations

1. Within zoo expertise
2. Accessibility
3. Scheduled maintenance plan

- F. Utility Usage
 - 1. Natural gas
 - 2. Water
 - 3. Electricity
 - 4. Consideration to conservation of utilities

- G. Weather Proofing
 - 1. Cold temperatures
 - a. hose/pool antifreezing
 - b. supplemental heating
 - c. insulation
 - 2. Warm temperatures
 - a. supplemental cooling
 - b. odor ventilation
 - c. humidity manipulation

Special thanks to Dr. Tim R., Glenous F., David J., Joanne T., and all the other various Toledo Zoo staff who helped with their critical review.

References

Pause, C., Rice, D. Design Handbook. Zoological Society of San Diego. Unpublished.

Pery, Dean. Stewart. 1970. Program for the New Boston Zoo. Boston, MA., Benjamin Franklin Smith.



Information Please

We are searching for exhibit specimens of two types and would like help in locating any zoological facility that has surpluses. We would like 2.2 of breeding age, elephant shrews (*Elephantulus refescens*) and 2.2, breeding age, African Spotted or Striped Grass Mice (*Lemniscomys striatus*). We will negotiate any other ratios, ages, etc. Any information would be appreciated. Please contact Debbie Merritt, Zoo Department, New England Science Center, 222 Harrington Way, Worcester, MA 01604.

If you have had an orangutan infant adopted by another orangutan, or have attempted this procedure at your zoo, please send any available information to: *Gail Bruner, Los Angeles Zoo, 5333 Zoo Drive, Los Angeles, CA 90027.*

KEEPER'S ALERT

Riverbanks Zoo AAZK Chapter is having a special sale of its packaged sets of greeting cards. The sets include 16 blank cards (8 different animal designs) and 16 plain envelopes. The cost is only \$3.50 per set. We sold a lot of these cards locally and think other AAZK members will enjoy them too. Send orders to: Pat Hook, 307 Augusta St., West Columbus, SC 29169.



Reflections on Luama

By

Robert Berghaier, Senior Keeper
Philadelphia Zoological Society
Philadelphia, PA

For those interested in the survival of animals in the wild, it is convenient to forget about the people who live alongside wildlife. It is the actions of this human element which will ultimately decide the fate of many of the world's wild places and creatures. During a trip to a remote area of Zaire I saw firsthand the conflict in one small valley between the needs of an expanding human population versus a declining but vibrant wild fauna.

I came to the Luama Valley of East Kivu province in the fall of 1984 to visit my friend Jim. Jim was a Peace Corps volunteer who was assigned to the valley with another American to assist a cattle ranching cooperative. It was Jim who, by talking to an old Belgian colonist in Goma, discovered the history of the Valley.

Until the 1950's the Luama Valley was a lush forested paradise. The area is a series of rolling hills with meandering streams, some with picturesque waterfalls. The soil is of volcanic origin, so it is very fertile. The hills and valleys are covered with a lush forest with a high canopy. The average elevation of Luama is about 5500 ft. The evenings and early mornings are cool and often foggy. The mornings and afternoons are warm and the humidity is low. It rains at least once a day for about an hour. During the rainy season, showers can last all day. On the whole it is an idyllic climate.

Small herds of elephants were common here wandering through the valleys and hills. Cape buffalo, bushbuck, duiker, and forest hog grazed or rooted through the clearings opened by trees falls or by foraging elephants. Leopards were the principle predator. Good numbers of eastern lowland gorilla and chimpanzee were present. Black and white colobus and olive baboons were plentiful. The other species of primates included congo blue monkeys (*Cercopithecus mitis stuhlmanni*) and L'Hoest guenons. The only human inhabitants were the Batwa pygmies, a hunter/gatherer society which lived in balance with the forest and the animals.

The first major changes were implemented by Belgian ivory hunters. By 1960 all of the elephants in the area were eliminated. In the Luama Valley alone five tons of ivory were collected. Leopard hunting with snares came next, the pelts being used in the fur trade. Two Belgians, including one Jim befriended in Goma, started tea plantations and cleared large sections of forest. Men were needed to work the plantations, so outside workers were brought in. These men, mostly KiRawandan Bantus, brought along their families. More forest had to be cleared to grow food for this expanding population. These cultivators also hunted to supplement their diets. Large mammals were the primary targets. While the human population remained low, this hunting had little effect on wildlife numbers. Unfortunately, events occurring elsewhere in central Africa would change this status quo.

In the early 60's the so-called "winds of change" would cross the Belgian Congo and the new nation of Zaire would be created. The resultant political instability caused the two Belgian planters to flee the Luama Valley. The workers, however, remained. Adding to their expanding numbers were Watusi cattle herders driven into Zaire due to tribal strife in the neighboring country of Rwanda. They settled in the Luama Valley with their herds of long horned ankoile cattle. Cattle need pasture, so the process of forest clearance started by the KiRawandans was excellerated.

The expanding human population of the valley also meant expanding hunting pressure. By the 70's the forest hogs, bushbuck and duikers were eliminated. The last of the valley's leopards was snared. The last buffalo was speared when it took to hanging around the cattle herds. Even the local people realized that the buffalo was probably seeking companionship. With the larger mammals gone the hunting pressure turned to the primates.

When I reached the Luama Valley in November of 1984, the once lush continuous forest was broken up into small isolated patches. Now, 3/4's of the valley was either cattle pasture or shambas, the small plots used for farming. Some primates were still evident. Scattered groups of blue monkeys were often encountered. One group was located a short walk from Jim's back door. Each afternoon during my stay I would approach this group. I even managed to eventually photograph them a few times. They would eye me curiously at first, then slip away--all except for the largest, probably the lead male, who would bark at me until the group had moved off. Then he too would vanish into the forest.

Once I went monkey watching with some of the local kids. They were excellent trackers. Their ears could pick out the soft calls that the monkeys would use to communicate while feeding. However, as soon as the primates spotted those little black faces, they ran off into the canopy. These animals obviously knew they were potential prey. All of the young male inhabitants of the vicinity carry slingshots. A good-sized rock shot from one can bring down a large bird or a small monkey. Someone should undertake a study one day on the effect of young boys with slingshots on local wildlife populations. No matter where you travel in the Third World you see these lethal weapons sticking out of back pockets.

Jim once asked a local boy why they hunted, since there were lots of chickens and pigs to use for meat. His answer was, why should they pay for a chicken or a pig while free meat remained in the forest? Even the most ardent animal lover must admit that is a very logical and practical answer. Dogs and spears are used to hunt olive baboons in the valley. Baboons are very destructive when they raid the local shambas. Their behavior and the fact that they are primarily terrestrial means they are hunted with a passion. The number of baboons is dwindling rapidly. The screams of baboons while being pursued by hunters often echoed throughout the valley. Other primate species were caught by snare traps set at the base of limbs or trees. The only L Hoest guenon that Jim ever saw during his two year stay was caught in such a manner. Only twice during the duration of his tour did Jim see colobus. These monkeys are heavily hunted for their black and white pelts which bring a high price in nearby Goma.

A small troop of chimps still remained. Chimpanzees are large, potentially dangerous animals, and the locals are terrified of them. They will only hunt them with guns. There are a few old hunting rifles located in the valley, but bullets are few and far between. This particular group of chimps causes extensive damage to the area's banana groves, a behavior not likely to endear them to the locals. I was guided to see this chimp group by some local men. At about 200 yards distance the chimps started that eardrum-splitting shriek that chimp keepers are all too familiar with. We closed the distance between us to 50 yards. I counted six animals, including one youngster, sitting on a branch looking at us. My local guides were keen on looking at the group with my binoculars, and they seemed as enthused about seeing the chimps as I was. While talking to some valley residents, I heard some hair-raising chimpanzee stories. Once, a crop raiding male chimp was speared. This animal pulled the spear from its body and chased after the offending villagers, shaft in hand. Once, a baby chimp was caught in a wood trap box. Its enraged mother ripped the trap from its moorings and carried it off with her baby inside. Even though the locals do not hunt chimps, outsiders do. Bored soldiers and policemen travel from Goma to the valley for a bit of sport. It is illegal to hunt chimps in the East Kivu, but since few people know of this restriction or even care, the number of chimps slowly dwindles.

In contrast to the declining numbers of wildlife of other species, the gorillas of Luama are doing fairly well. A wealthy Zairean businessman who has extensive land holdings in the area has actually set aside the top of a steep mountain as a gorilla sanctuary. Several local men are paid by the land owner to watch over the gorillas. They told Jim and me that when the sanctuary was started 10 years previously, only 14 gorillas were found there. They now number over 30 and comprise two groups. Their mountain top refuge is unfortunately pitifully small and isolated from other forest remnants, so the gorillas cannot expand their range. One adult male has been driven out of the sanctuary by the other males and now resides in a small area of forest at the foot of the mountain. This male, with no chance of accumulating a

group of females for his own, takes out his frustration by charging local people who get too close to his patch of forest. Eventually, someone will be severely injured or perhaps killed, and a hunter will have to be dispatched to end this gorilla's lonely existence.

I managed after a two-hour walk and a one-hour climb to see one of the gorilla groups. The slopes of the sanctuary were incredibly steep. We passed through a banana grove and the trackers showed me some of the fruit the gorillas had eaten the night before. Bananas are the main crop of the area. Ninety per cent of them are used for make pombe, a type of beer. I was surprised to learn later that much of the destruction of forest in Central Africa is due to clearing these areas so more pombe bananas can be grown. I find it personally ironic that the survival of much of that area's fauna is tied to beer production. Shortly after leaving the banana groves and entering the forest, we heard the loud scream of a very frightened gorilla. We cautiously moved through the dense growth. My guides spotted the gorillas long before I could make out their black bodies in the thick green foliage. I finally climbed a tree and spotted an adult female moving through the vegetation. I climbed down and the trackers said softly, "Toto, toto (babies)", and pointed to two young gorillas who sat on a log squatted on their heels watching us. In the background I could hear the short sharp coughs made by distressed gorillas. The guides then pointed out the lead male of the group. He was immense! I saw him from about 20 yards distance and could only see his head and upper torso. I observed mountain gorilla silverbacks in Rwanda a few weeks later, but not one of the three I saw approached this animal in size. He remains the largest gorilla I have ever seen in captivity or in the wild. I quickly noticed that he was very upset by our presence. He kept his lips pursed and kept turning his head when he caught us looking at him. That behavior, combined with the continuing vocalizations, convinced me that I was doing this group of gorillas no great favor by being there. After a few minutes I said that was enough and our group started down the mountain to leave the gorillas in peace. The Africans I was with must have thought I was crazy, or perhaps scared, for leaving after such a short period of time after such a long trek to find the gorillas. After seeing how calm habituated gorillas were in Rwanda when humans were present, I realized I made the right decision that day.

The locals feared gorillas. Some believed that gorillas eat people, but the more knowledgeable ones correctly state that gorillas eat only vegetation. They also have a local tale which Jim scoffed at, but which I think may have a bit of truth. A Luama friend of Jim's told us that once a male gorilla tried to run off with the man's oldest child who was an infant at the time. This sounds farfetched unless you know how protective male gorillas are towards the infants in their group. I think it may be possible that a male gorilla may have trouble distinguishing, while under the stress of encountering people, whether a wailing little black infant is a baby gorilla or a human. I also have noticed captive gorillas pay close attention to very young human visitors. At any rate, the village's entire male population charged the gorilla, who fled before the infant came to any harm.

I saw other wildlife during my stay at Luama. They included giant squirrels, silver hornbills, plantain eaters, crested hawk eagles, mouse birds, beautifully colored sunbirds, red bishop weavers, and longtailed wydahs. I saw many other birds, most of which I could not identify. Civits and mongoose do well in the area. They would on occasion make off with one of Jim's chickens. There is one animal that the locals say exists that I am puzzled about. They call it the dog of the forest, and they are afraid of it. I questioned a local boy who had recently seen one. I showed him the illustrations from the *Collins Field Guide to African Mammals* and he pointed out the side striped jackal. Jackals and other wild canines are not normally found in African forests. Since much of the original forest has been cleared perhaps the jackals have been able to exploit this new habitat. I had this same individual look through the rest of my field guide and comment on what species were still found in the area, and to this he added which ones tasted good. Most creatures, unfortunately for them, taste good.

I am sure many of the attitudes expressed by the Luama residents about the local wildlife would upset many animal lovers. The fact that large numbers are slaughtered often by cruel means is disturbing. It must be remembered, however, that these people are very poor. The average daily wage in the area is 5 Zaires a day, 40 of which make up a US dollar. Any supplement to the local people's income from the sale of meat or pelts does help raise their

Reflections on Luama, Continued

standard of living. The greatest threat to the wildlife of the Luama Valley is habitat destruction. It is unfortunate that a system of reserves has not been set up to keep the more steeply sloped areas forested. Such a system would serve three purposes. The first would be that the soil in such areas would be held in place by the forest. Steep areas that are under cultivation lose great amounts of soil during heavy rains. Even now, erosion is a serious problem in some areas. The second benefit the forest would provide in an area that could be used for gathering of plants used in traditional medicine, raw materials for clothing and building materials. The final benefit would be the use of the forest for both meat and recreational hunting.

I personally find nothing wrong with hunting, as long as animal populations are not depleted enough to cause local extinction. Wildlife, if used wisely, can provide a renewable resource. If a limited number were taken by hunting, the natural reproduction of a species can replace those individuals sacrificed. The suggestion that hunting can be a type of recreation may sound callous to some. The Luama residents, except for church and occasional celebrations, have no means of entertainment. There are no TVs, or movies, and books and batteries for radios are too expensive for most. Hunting does provide something for these people to do. What I am proposing is that indigenous peoples who live beside wildlife must be shown practical reasons for allowing that wildlife to survive. If these people can be convinced that areas set aside in their natural state will provide them some benefits, they are more likely to preserve such areas. Without habitat, no animals can exist. The theoretical benefits of conservation, such a protecting examples of a worldwide heritage, endangered species, or representative gene pools would find no sympathetic ears in Luama. It is not too late to set up a reserve system in Luama or elsewhere in East Kivu. The local government, however, does not have the funds or the interest to implement such a project. Outside agencies such as the Peace Corps are more interested in conventional agricultural pursuits.

As much as I care about animals, I do not blame the people of Luama for the destruction of the area's wildlife. If you spend some time with these folks you realize what a hard life they have. In spite of their plight, the Luama people are polite, warm and generous. You cannot help but develop an affection for them as individuals. They found it very amusing that I wished to look at animals instead of hunting them. When it was explained to them that in America people pay to see the very animals that they share their valley with, they were astonished. When I took a walk looking for galagoes my first evening in the valley, the local villagers asked Jim and his postmate what I was doing. When they explained my interest in viewing the animals instead of eating them, the locals went into hysterics. They went back to their villages and, with a great sense of humor, told their children that I was looking for little black babies so I could eat them. Afterwards, any local children under six I came across in my travels would run screaming to their mothers whenever they saw me.

It has been over two years since I visited the Luama Valley. Jim has completed his tour with the Peace Corps and is now back in the States. He reports that the mountaintop gorilla sanctuary has been officially recognized by the Zairian Park Service, but they send no money to help operate it. The landowner from Goma continues to pay the guards who have decided on their own to protect the chimpanzees of the area as well. The lone male gorilla at the foot of the mountain has become more aggressive and is now greatly feared by the locals.

The forest behind Jim's station was cleared for cattle pasture shortly after I left. He never again saw the blue monkey troop found there, and does not know their fate. I have slides of that forest and those monkeys which I look at on occasion.



Dear AAZK Member,

October 4-8, 1987 will find the 13th National AAZK Conference being held in Milwaukee. Hundreds of zookeepers, other staff and volunteers will meet for papers, tours and fun. This is the only event specifically designed for zookeeping and the trials and tribulations for both keeper and animal.

Most important, the conference is an opportunity to socialize with fellow professionals. The chance to tell of successes, find solutions to problems and stimulate thought in both directions are all in the offing. Here you can find that your zoo is not that different from any other.

Financially, you cannot afford to miss this conference. Milwaukee is a large city of modest prices. Following is a list of expenses you will encounter.

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Give serious thought to attending the National Conference. We're sure you'll want to attend year after year.

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Across:

27. Conference '87 will be held in which month?

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11. Conference '87 hotel: - - - - - N.

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OCTOBER 4-8, 1987
Milwaukee, WI

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Vegetarian: Yes No (Specify Type _____)

Banquet Entree: (check one) Beef Chicken Vegetarian

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AAZK Membership Status and Fees:

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October 4-8, 1987



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Growing Hydroponic Grass at the Bronx Zoo

By

*Diane Lord, Mammal Keeper
Bronx Zoo, Bronx, NY*

When I first began working at the Bronx Zoo, I became intrigued by the daily deliveries of what seemed to resemble sod. Along with the rest of the animal food items were these large strips of fresh, succulent green grass. These tender shoots were bound together underneath by an entanglement of clean white roots. All I knew was that the animals relished it. I didn't know where it came from or how it was grown. I decided to find out.

George Fielding, Animal Commissary Manager, was the man with the answers. Up the stairs I went, into a large trailer, for a tour of the production of this unusual food: hydroponic grass.

By controlling temperature, humidity, aeration and light, grass can be grown without soil. Four pounds of seed can be converted into 32 pounds of grass in just 7 days!

It's not a new idea. The basic principles date back to 1669 when Woodward, an English scientist, attempted to grow plants in water. Almost a century ago, European farmers who wanted to maintain milk production in winter soaked kernels and germinated them in a warm place in the barn. The term "hydroponics" is generally credited to Dr. W. Gericke who developed the first large scale plant production in nutrient solution in the 20's. Armies have used hydroponics to grow vegetables in desolate areas.

We use succotash, a mixture of wheat, barley and oats. (One tray of sprouted sunflower seed is also used daily because of its palatability to the primates in Jungleworld.) Seed must be untreated; free of fungicides and bactericides which may be harmful to animals. Since untreated seed harbors a wide variety of mold spores and bacteria which would flourish, we soak the seed in a 1% Clorox® solution for 30 minutes. The seeds aren't rinsed, causing the chlorinated odor some keepers detect before rinsing their grass. Soaking also stimulates germination and reduces the slimy sediment from grain dust which clogs pipes.

Each day a set of trays is harvested. It is their 7th day of germination. And each day that set is replanted. The days of the week are written near each set of trays facilitating the identification of that day's crop. The plastic trays are filled with 1/4 inch of soaked seed and placed on the shelves of large tiers. Any cooler than 66 degrees F would inhibit grass growth. Any warmer would encourage mold. Regular fluorescent lights are used since "growth lights" aren't necessary for such short term harvesting.

The seeds are watered four times a day governed by a timeclock. Water is pumped from a resevoir on the floor up a pipe over each shelf where the water is released through tiny holes. The result is a rainfall dramatic enough for you to require a raincoat! Occasionally keepers receive grass with more roots than shoots. The hull of a seed may have blocked a water hole. Most of the water soaks through the seedlings to the bottom of the tilted tray where carefully designed grooves funnel the water to a collecting trough and back to the resevoir. The rest of the rain which hits the walls and floor runs down the slanted floor, also recycled to the resevoir.

The first rain is at 12 noon and contains only a mild chlorine solution for initial disinfection. Most of this chlorine will disperse into the air. The remaining 3 rains (6 p.m., 12 a.m. and 6 a.m.) contain nutrients. This is accomplished by putting chlorine in the resevoir and sprinkling 5 oz. of a powdered nutrient mix on the floor. The chlorine in the resevoir is used in the first rain which eventually hits the floor, dissolving the nutrient mix there. The dissolved nutrient mix flows down to the resevoir and is used for the next 3 rains. Clever!

Growing Hydroponic Grass at the Bronx Zoo. Continued

The nutrient mix we use is called "20-20-20" and contains 20% each of nitrogen, phosphorus and potash, a potassium compound. It results in a slight increase in fresh weight, mineral and carotene content. Some individuals, however, argue that the increases due to the nutrient mix are not significant and question using the nutrient mix at all if seedlings up to 8 days grow mainly at the expense of their own reserves. But the nutrient mix is not exorbitant in price and seems to make sense, so most continue to use it.

On the 7th day the grass is harvested. Seven-day grass is richer in protein, vitamins and minerals than younger grass. Older grass can cause clogging and is more likely to contain mold. Keepers can identify mold by inspecting the root area and the base of the blades of grass. Often it is seen as black or colored dots or as fine white, gray or black threads. Smell the roots. They should smell sweet, not sour. If in doubt, throw it out!

Some question the point of hydroponic farming. Wouldn't it be cheaper to feed the original seeds than to spend all that effort and electricity getting them to sprout? The composition of the sprouts are indeed predetermined by the composition of their respective seeds. But some animals prefer the sprouts to the seeds, and eating grass takes more time. They are provided with an activity, and an excellent treat. But most of all, hydroponic grass is a very cheap form of fresh vegetable matter useful as a partial replacement for produce. We get over 1000 lbs of grass from 128 lbs of seed with only 2 1/2 hours of labor a day. And some sprouts are quite rich. Sunflower sprouts, for example, are higher in protein and fat than lettuce, celery and green beans! Hydroponic grass can't, however, compete with either hay or pellets for the feeding of ungulates.

Claims have been made that hydroponic grass stimulates virility, litter size, growth and lactation, possibly due to some unidentified grass juice factors. Some feel very strongly about this although others insist there is no conclusive evidence. Cereal grasses from oats, wheat, rye and barley do contain orally active estrogen.

Other benefits: Calcium and zinc levels are greatly increased. Other minerals and protein rise only slightly and copper and potassium drop slightly. Carotene, vital to reproduction as a precursor of vitamin A, rises dramatically. Its synthesis is closely associated with chlorophyll synthesis and is probably greatly stimulated by light. The grass is an excellent source of vitamins C, K, and E and represents a steady source of fresh vegetable matter through all types of weather. Zoos have used it not only for hoofstock but also for tortoises, iguanas, primates, birds, bears, mice, hippos, kangaroos, and even insect colonies!

What began as an amusement in something new to me led to an understanding of this interesting product we call hydroponic grass. I'm happy to have been able to share what I learned with you.

(Bibliography: conversations with George Fielding, Animal Commissary Manager, Bronx Zoo; Dr. Ellen Dierenfeld, Nutritionist, Bronx Zoo; and Mel Lentz, founder of Hydroculture, Inc., Glendale, AZ. Also, Sergio Oyarzun's article, "Hydroponic Crops: A Valuable Alternative for Feeding Zoo Animals?" in the Proceedings of the 1st Annual Dr. Scholl Nutrition Conference, 1980.)





"This diet has doubled our breeding."

Charley Azzopardi
Amarillo, Texas

"You have to watch their diet very carefully."

He said these animals don't breed well in captivity and that the diet is really one of the keys to keeping them healthy and reproducing. The special diet the big cats consume comes from Hereford Bi-Products and is the result of tests and experimentation by the company's owner Garth Merrick.

"He has really been wonderful," Azzopardi said. "The diet that he's developed has doubled our breeding here. Everybody can't understand how we get so many cubs."

Another person Azzopardi has a great deal of praise for is Johnny W. Weller, a veterinarian. Although he is a practicing a great deal of preventive medicine, the wild life entrepreneur said that

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An article

about Charley Azzopardi,
Amarillo, Texas, published in
ACCENT WEST magazine.

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Pandas Arrive at the Bronx

By

Mark L. Hotling, Menagerie Keeper
Mammal Dept., Bronx Zoo
Bronx, NY

Panda-monium has hit the Bronx Zoo. Two Giant pandas (*Ailuropoda melanoleuca*) on loan from the Beijing Zoo arrived at the Bronx Zoo on 19 April. The two, on a six-month loan, are Ling Ling (Ringing Bell), and Yong Yong (Forever and ever). They were held in quarantine until 30 April to give them time to recover from their trip and to adjust to their new exhibit. Due to pandas' solitary nature as adults, they will be exhibited one at a time. Ling Ling is a one-and-a-half-year-old male presently weighing in at about 120 pounds. He was conceived by artificial insemination and born in the Beijing Zoological Gardens on 5 September, 1985. Yong Yong is a six-year-old female who now weighs about 190 pounds. She was found as an abandoned infant in the Sichuan Province. Yong Yong arrived at the Beijing Zoo in 1982 where she was estimated to be about eleven months old.

The arrival of the pandas at the Bronx was the result of many peoples' efforts, but New York City's Mayor Edward I. Koch and William Conway, General Director of the New York Zoological Society, deserve much of the credit. Mayor Koch said, "April certainly isn't the cruellest month in New York this year, thanks to the arrival of the pandas in the Bronx. This is the culmination of years of efforts by others, as well as myself, to persuade the Chinese to let us see these magnificent animals in New York. I am grateful to the Chinese Government, my friend Mayor Chen Xitong of Beijing, and the Beijing Zoo for making it happen. This is a perfect example of how to bring distant peoples together. The pandas are ambassadors extraordinaire." Dr. Conway said, "The Giant Panda's plight is a poignant symbol for endangered wildlife everywhere, and the panda itself is an engaging stimulus to visit the Bronx Zoo. Besides, New Yorkers have a special interest in Giant Pandas. The New York Zoological Society has been working in China since 1980 helping Chinese conservation biologists to define and resolve the threats to the panda's future."

New York Zoological Society involvement in panda research began in 1980 when George Schaller, Director of Wildlife Conservation International (WCI), a division of the New York Zoological Society, joined Chinese panda experts as part of an international effort to save the panda. Dr. Schaller worked in Wolong and Tangjiane Reserves until 1985. His studies have since been continued by WCI researcher Donald Reid. The study and its conclusions are described in Giant Pandas of Wolong, by Dr. Schaller and his Chinese colleagues. New York Zoological Society has also helped the Chinese government establish a captive breeding program designed to improve their rate of success with panda births. Dr. Emil Dolensek and Dr. Janet Stover of the Animal Health Center of the Bronx Zoo have journeyed to China to contribute their expertise concerning reproduction studies. The loan is indeed a continuation of that support. A nominal fee is being charged to see the pandas, and net proceeds will go to the Chinese to continue panda research.

Back in the Bronx, the pandas Ling Ling and Yong Yong will be cared for by Senior Keeper Bill Sheshko and Keeper Laurie Thomas, both of whom are dedicated professionals. To prepare to care for the pandas, Bill and Laurie made a trip to the National Zoo in Washington, DC to talk with panda keepers there. They have also spent many hours studying Giant Panda history and biology. Ling Ling and Yong Yong were accompanied to the Bronx by a Chinese veterinarian, Dr. Wong; Mr. Shi, Director of the Beijing Zoo; and a translator, Mr. Gao. They have been most helpful in showing Bill and Laurie the ins and outs of panda keeping.

So, if you an opportunity this summer to come to New York, be sure to come to the Bronx to see Ling Ling and Yong Yong. They will be on exhibit from 10:00 a.m. to 5:00 p.m. Monday through Saturday, and until 5:30 p.m. on Sundays and holidays. There will be a separate charge for the Giant Panda Exhibit in effect of \$1.00 for adults and \$.50 for children ages 2-12. All net proceeds will go to the Chinese for their Giant Panda Conservation Program. The tickets will be sold for specific viewing hours on a "first-available-hour" basis. The best time to see the pandas will be in the mornings and late afternoons, which is when they are most active.

Pandas Arrive at the Bronx, Continued

For further information, please call (212) 367-1010 ---- *Mark L. Hofling, Menagerie Keeper, Mammal Dept./ Corresponding Secretary, Bronx Zoo AAZK Chapter.*

I wish to express my special thanks to Dr. Fred Koontz, Associate Curator of Mammals, for his help in providing sources for this article.



Interview: M. Kamal Naidu, Director, National Zoo, India

By

*Sally Walker, Honorary Advisor
Zoo Outreach Organization*

SRW: Mr. Naidu, would you tell us something about your background and how you became interested in zoos?

MKN: I've always been interested in animals from my childhood when I used to keep animals in my bedroom! I grew up on a farm and we always had a variety of animals. I used to rear baby animals myself from the time I was a tiny child. I kept snakes and fish in my room until my college days. I chose Agricultural College so I could join the Forest Department.

As a Divisional Forest Officer I had occasion to rear a variety of baby animals which had been orphaned or strayed out of the forest. I taught at the college for several years which gave me the chance to visit many zoos and National Parks and Sanctuaries in India accompanying the students. It was because of this background that I was chosen Director of Nehru Zoological Park in Hyderabad.

As the Director I had to learn my zoo administration from scratch as there were no guidelines and no one to guide me in how to manage it. I would daily go and catch hold of some keeper and accompany him to each cage and see what he did there. In his desire to please me he would show me everything and that became a lesson to me. And later I started codifying all this and then learned some of the things that go into the care of animals. In course of time I read many books, talked with many people and built up my own philosophy of zoo management.

SRW: What does it mean to be the Director of National Zoological Park of India? What responsibilities does it entail?

MKN: To be Director of National Zoo is a very responsible position. In recent years it has been decided that the National Zoological Park would be the coordinator of all the zoos in the country and implement certain decisions for the welfare of the animals and with the aim and objective of achieving conservation, education and research in a coordinated manner. It is the only zoo in the country funded entirely by the Central Government and when it was set up even as Delhi Zoo 27 years ago it was with the intention of providing a model for other zoos in India to follow.

INTERVIEW, *Continued*

SRW: What specific programs do you have in mind for coordinating zoos?

MKN: The program we have in mind first is for starting studbooks which we have initiated by assigning different animals to different zoos. We have requested the zoos to pass on their stock information to us so that we can introduce a system of breeding loans with systematic and mutually beneficial exchange of animals between different zoos in the country.

SRW: The National Zoo has hosted some interesting symposia in the past. Do you have any plans for workshops or symposia this year?

MKN: Yes. We hope in future to have more of these at least once in a year so we can pool our knowledge and obtain information from all the zoo directors.

SRW: What about training programs?

MKN: Yes. We have a plan for initiating a training program for zoo attendants and keepers from January '87. We have requested about 15 zoos to send their keepers and once this first batch comes we can see our shortcomings and what is required for them and formulate plans for future courses including more people. We would like to have it as a continuous affair with a one month course for the regular keepers and when the older keepers or Head Keepers come we may have it a two-month course. As it is this year, we have initiated the Hissar Veterinary College trainees on a 15-day internship to the zoo and that went on very successfully.

SRW: What do you see as the major problems in Indian zoos today?

MKN: The major problem facing our zoos today is that our keepers are not of a high education standard and they don't have any concept about scientific management of a zoo. As a result we have to take up a program of educating the keepers and other staff of the zoo about the aims of the zoo so that they could carry on the message to the visitors.

The people who visit the zoos in India are often uneducated or illiterate people. They can be best approached by our present keepers who are of the same level of education and sophistication.

SRW: Some years ago--and this crops up from time to time--it was suggested to make a separate Zoo Authority of India. What happened to that idea and do you see it coming to pass?

MKN: That was contemplated at one time but now we don't have any intention of forming such an authority. Now we have a Ministry where there is a Directorate of Wildlife and that covers the zoos. We have a Director and a Joint Director of Wildlife who are dealing with all matters of wildlife and as zoos come under the purview of wildlife it is being handled at that level.

And I think with a coordinating body of Zoo Directors which is being linked up ultimately with the Ministry and with the Director of Wildlife for the whole country as the Chairman of that body, I think that sort of coordinating by a Ministerial body would be sufficient.

SRW: Could you elaborate about the Association of Zoo Directors? Has it been decided exactly how this will be formed and will there be a Code of Ethics and such things?

MKN: The preliminary meeting had taken place on the 25th anniversary of the National Zoo and it was decided that a Union will be formed. It was also decided that a Code of Ethics would be chalked out which everyone will adhere to ultimately. Unless we have such a code and abide by it, no union will be worth its name.

SRW: What is the general feeling about international cooperation? The AAZPA has put together an International Species Inventory System for all the captive animals in the world which they are hoping everyone will join. What do you feel about participating in such programs?

MKN: It is absolutely essential if we are pursuing the aim of conservation. Conservation is not merely breeding of animals but keeping in view the genetic complex of the animals is also a very

INTERVIEW, Continued

important aspect. Without keeping the genetic make-up of a species there is no point in breeding from the same line generation after generation as it has happened in some of our zoos with just a single male or a single female in a group. This has happened with the white tiger. They had degraded very badly genetically so now we have spread them out to different zoos and asked them to breed with their local males, raise the offspring and breed them back to bring in new blood lines.

I think all zoos in India should unite among ourselves and then with the international bodies. I think we should never hesitate to exchange animals or give them on breeding loan. We should act for the species and not for the institution.

SRW: There seems to be a sort of prejudice against importing and keeping exotic animals in India by certain conservationists and even wildlife officials. What is the reason for this? The people want to see them and zoo directors naturally need to please the public at least to some extent.

MKN: I think India has a very broad spectrum of animals in our own country. I don't think many people know much about the species that we possess ourselves. On the contrary, the minute we talk about the zoo, every zoo director wants to have a zebra and an ostrich and a giraffe and a kangaroo. These species have formed an important part of the animal alphabets with the result that every school child wants to see these animals. But we are trying to discourage the obtaining of certain species like the antelopes, the carnivores, the rodents from other countries. I don't think it is so very necessary to get them when we could exhibit our own species to the people and enlighten them about what a rich heritage of wildlife we have that should be preserved and protected.

This sort of restriction we want to impose more on the zoos at the regional levels and in the smaller zoos whereas the state zoo could exhibit these animals for the people to see.

SRW: I believe National Zoo has a plan for a model education program.

MKN: Yes, education has been a sadly neglected activity in our zoos. All along it has been only considered as a place of recreation. Of course, people did get a little segment of education as in the school books as in "z" is for zebra and "e" is for elephant and that sort of thing created the idea that animals could be used as educational tools. Then children could be taught that the zebra was from Africa, kangaroo from Australia and so on, but the zoo as such has not been properly interpreted in the past. Only in recent years have we started feeling that proper interpretation is necessary to link up the animal with its environment. And also to exhibit the need for conservation for certain species. This can best be done by interpretation programs.

Since we did not have much know-how in this regard, the US Fish and Wildlife Service has cooperated with us in drawing up a program of zoo interpretation which is now underway. A comprehensive and coordinated program with waysides, brochures, etc. is being prepared at the Centre for Environmental Education at Ahmedabad. When that is finished, hopefully by the end of November, it will provide a model for other Indian zoos to follow. They can evolve their own things based on their own environment.

SRW: Some of the India zoo directors are disappointed that they have not been able to procure certain equipment from abroad, such as tranquilizer guns, drugs, etc. Project Tiger Centres have this equipment. Why can't the zoos get it?

MKN: This is also underway now. We have written to the concerned persons and this is another aspect where we are going to have a centralized control. We are having a problem getting feedback about what they need from all the zoos. Once they have responded to our queries we will have the data which will enable us to place an order. Tentatively based on the information we have received from some zoos, I have projected our annual requirement and we are going ahead with it.

SRW: What are some of the priority breeding programs in some of the zoos?

INTERVIEW, Continued

MKN: The priority breeding programs are based only on the endangered species -- the Indian Rhino, the Swamp Deer, Indian Bustard, White Tiger and certain other threatened species. Now crocodiles have come out of that state. They have been hatched and reared in captivity -- a project initiated by our zoos -- and released back to the wild state. Some other species that have been returned to the wild successfully are the Spotted Deer, the Sambar, the Blackbuck, etc.

SRW: In the Wildlife Action Plan, on-site captive breeding centres are described which are not open to the public but would be adjoining to or near the site of certain species natural habitats. Is the implementation of this impending in the near future?

MKN: This is very much a part of the Plan and there is a specific budget allocated for that. Many sanctuaries and national parks have been asked to earmark a specific area for captive breeding of endangered species in their sanctuaries and national parks.

I think for the time being more emphasis is being given to the natural habitat for this captive breeding rather than the zoos. And we may take up in the zoos such of the species that have come down to such a level that it becomes absolutely necessary to bring them into captivity under zoo conditions and breed them and study them intensely. Whereas this present project is to protect them in their natural environment where they breed and then sort of over from that breeding centre into their natural habitat.

SRW: In India you have the National Forest Policy and the National Wildlife Policy. Do you have any plan to have a National Zoo Policy?

MKN: Yes, in our National Wildlife Policy a lot of statements pertain to the need for the development and maintenance of zoos. Some 14 years ago in 1972, a Committee was set up under the Indian Board for Wildlife constituted of experts to study the setting up of model zoos. One of the recommendations of the Committee was the formation of a National Zoo Policy. Now according to the recommendation of that committee and the Wildlife Action Plan, we are contemplating formulating a National Zoo Policy for the country under which we will set standards. If a zoo does not meet the set of standards outlined in the Policy, the government would take drastic steps including the closing down of the institution. For example we want to insist there should be a minimum area for a zoo, a minimum area for individual enclosures and for the animal. There should also be a minimum number of animals in an enclosure. Because the ultimate aim is conservation with education and research as well. With this object in view the Zoo Policy is being drafted. And also we want to impose certain restrictions on the zoo that they should not go beyond their capacity to maintain a zoo. They should not crave and get everything every other zoo has. They should have some restrictions. Unless this is done, the zoo will become the antithesis of conservation and may drain the last remaining animals of the threatened species.

SRW: Do you feel that many animals are being taken from the wild state for exhibition?

MKN: Yes -- it is being done by some of the zoos clandestinely. It had come to our attention last year and drastic action is being taken against such zoos. They have been suitably warned. It is with that idea that we want to develop this Zoo Policy with certain stringent deterrents to stop clandestine acquisition of animals. Every animal should now be taken from zoo-born stock rather than taken from the wild. Because the present situation in our country is that many animals are getting depleted far beyond the requirements for breeding.

SRW: Western zoos rely heavily on volunteer programs for educational, fundraising and even some animal care assistance. What is your feeling about this? Is it desirable in India?

MKN: I feel it is very much necessary because voluntary organizations coming to the aid of the institution are indicative of people genuinely interested in animals and their welfare, unlike the employee who is interested only in his bread and butter. He will not have the same dedication to the welfare of the animal as the people from voluntary organizations have.

INTERVIEW, Continued

I very much feel this group of people have to be encouraged. Again, there are some organizations and individuals who are trying to pose as volunteers only for the building of their own image. This has to be discouraged. A volunteer, if he is genuinely interested, will come and say "Here I am, ready to help you. What can I do?" It is that type of person we would like to encourage.

I was very impressed to learn from annual reports from western zoos that there are more volunteers working in some zoos than there are employees, some in a ratio of 1:4. That sort of thing would be very useful in helping with the staff, with the trade union activities which I understand in quite rampant even in the west. I am hoping to have a voluntary force trained to help so the unions can't blackmail us.

SRW: It has been suggested that the zoos be made an essential service so that strikes are not permitted and valuable and innocent animals should not suffer.

MKN: That has been recommended by the Expert Committee on Zoos. We are actively thinking along those lines of getting it declared as such, at least for the Animal Section if not for the whole zoo personnel.

SRW: On behalf of Zoo Outreach Organization, I thank you for giving us some of your valuable time.



A Note on the Behavior of Captive Nilgiri Langurs (*Presbytis johni*)

By
Pundareeka Rao, Warden
Sri Chamarajendra Zoological Gardens
Mysore, India

"Our beautiful wildlife is becoming extinct..."! Throughout India, growing numbers of people are at last becoming aware of the terrible plight of our country's natural heritage, and of the pressing need to preserve our remaining wilderness and the plants and animals dwelling within them. The role of zoological parks is also increasingly recognized, not only to provide last-resort living space for critically endangered species, but also opportunities for behavioral research and captive breeding. Perhaps most important of all, our people are beginning to realize that only through close cooperation between our zoos, national parks, wildlife preserves and research institutions can we hope to save our precious wildlife.

As more zoos cooperate in exchanging research data and breeding groups, a number of successes have resulted in recent years. One of these success stories is the study and breeding of the Nilgiri langurs (*Presbytis johni*) exhibited here at Sri Chamarajendra Zoological Gardens in Mysore. Our director, Sri C.D. Krishne Gowda, planned a breeding program for the southern primates, including the Nilgiri langur. In 1982, three (1.2) langurs, ages 2 1/2 to 3 years of age, were brought from Anna Zoological Gardens in Madras, to Mysore, and released into an old ape enclosure. During the following two years, no breeding was observed. Finally in 1984, the three langurs were transferred to a well-planned, naturalistic enclosure designed especially for them by Mr. Gowda. Since then the author has observed the animals at all hours. In their new enclosure, so much like their natural environment, the three langurs interacted socially in a healthy manner. Furthermore, the author has never observed quarreling among them.

A Note on the Behavior of Captive Nilgiri Langurs. Continued

During the months of June and July, 1985, breeding between the male and both females was observed. On 9 January, 1985, to the great joy of the zoo staff, one of the females gave birth to a female infant. There were no complications. In color and pattern the infant was brownish black with a white face and white patch on the inner thigh. Both parents, and the other female, displayed continuous gentleness and attention toward the infant. Understandably, the infant seemed perfectly at ease with all three adult langurs.

After the first week, the infant attempted to walk independently, falling repeatedly, but always trying again. Both females watched this closely, and occasionally emitted high-pitched chattering sounds. Upon hearing the sounds the infant returned to its mother.

The author's presence inside the enclosure did not appear to disturb the langurs, except when there was an attempt to touch the infant. At such times, the langurs chattered and bared their teeth.

On 31 January, 1986, the second female gave birth to another infant, also a female. To our great sorrow, the first infant died not long after the birth of the second. The mother refused food for three days; however, after the fourth day she slowly began feeding again.

A week after the death of the first infant, the mother was observed nursing the infant of the second female. Since then, both females have shared the rearing of the surviving offspring (which is doing well and is becoming very active). Infant transferring has been reported by Poirier (1968); however, Poirier did not suggest that other females fed a mother's infant. Also, our captive-born infant shows more interest in humans than her wild-caught parents.

Our success with Nilgiri langurs points out the need for naturalistic habitats at zoos. In this way the modern zoo is able to educate the public, and to instill in them an appreciation for wildlife by exhibiting animals attractively, and as naturalistically as possible. To this end, modern zoos also must provide opportunities for study and breeding, liberal exchange of animals and research results, if they are to ensure the continued survival of wildlife, not only in India, but throughout the world.

Literature Cited

Poirier, F.E.: 1968. The Nilgiri langur (*Presbutis johnii*) mother-infant dyad. *Primates*, 9:45-68.

Acknowledgements

My deepest appreciation and thanks to our Zoo Director, Sri C.D. Krishne Gowda, Sri Mukunda Krishne Gowda, Panchanah Farm and Sally Walker, Zoo Outreach Organization for their support and encouragement. From the friends of Zoo Atlanta, many thanks to Fred Alvey for his valuable time in editing the manuscript, to Tony Vecchio for his technical review and advice, and to Susan Barnard for taking time to also edit and type the several manuscript drafts.



Book Review

Trends in Ecology and Evolution, Vol. 1 (1986)

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Subscription: \$43.00/year.

Journal Review By
Rick Emmer, Cleveland
Metroparks Zoo, Ohio

Trends in Ecology and Evolution is a new monthly journal that began publication last July. It covers a wide range of topics relating to the ecology and evolution of plants and animals, including population biology and genetics, conservation, coevolution, extinction and animal behavior. The journal is international in scope, although the vast majority of contributors is affiliated with institutions in the U.S. and Great Britain. Each issue, approximately 30 pages long, contains three main sections: News, Reviews, and Commentary.

The short one or two page News articles present brief overviews of subjects presently under investigation and/or debate, such as: 1) an analysis of the question of whether or not to maintain reproductive isolation of captive subspecies populations (July); 2) an update on the controversy surrounding the plight of the endangered northern spotted owl (*Strix occidentalis caurina*), whose forest habitat is sought for timbering by the U.S. Forest Service (November); and 3) a report on a recent symposium dealing with the evidence for and against the theory of reciprocal altruism (December).

The Reviews section contains longer, technical articles that present detailed summaries of the results of research in areas currently being studied. Among recent articles of interest to the curious naturalist are a synthesis of recent findings regarding the population dynamics of tropical rain forest trees (December), an analysis of differences in the behavioral biology of toothed and baleen whales (December) and a review of modern theories on the causes of mass extinction (November).

In Commentary, authors express and defend opinions on subjects relevant to evolutionary biology or ecology. Two recent commentaries have focused on the use of extinction models in wildlife conservation (August) and the effects of man-induced desertification in central South America (September).

Each issue also contains book reviews and a listing of upcoming professional meetings. Editorials and letters to the editor occur on an irregular basis.

To date, every issue of *Trends in Ecology and Evolution* has contained articles of interest to those in the zoo/aquarium profession. This is a quality publication; although the subscription fee may be too steep for some wallets; for those who can afford it, the journal is well worth the expense.



Egg Weight Loss During Incubation

By

*Kerry Hoffman, Keeper
Arizona-Sonora Desert Museum
Tucson, AZ*

The avian egg is a complete unit - a total package. All the material for turning a raw egg into a living bird is contained within the shell of the avian egg. When heat is applied to that egg, a spark ignites the metabolic furnace and the embryo begins to develop. Cells replicate and differentiate and the by-products of this metabolism are water and carbon dioxide. These by-products can be fatal to the developing embryo unless they are expelled from the egg; the mechanism of expulsion is the egg shell itself. The shell is covered with millions of tiny pores which allow oxygen, the fuel for the metabolic furnace, to enter the egg. As water is expelled from the egg, the egg loses weight.

If the eggs are being intensively managed in an artificial incubator, the weight loss of the eggs can be controlled by raising or lowering the humidity in the incubator. When the humidity is high the air is nearly saturated with water and the egg has difficulty expelling water vapor, so it loses weight slowly. A low humidity in the incubator pulls water from the egg and the egg loses weight at a faster rate. By adjusting the humidity between the two extremes the hatchery operator can control the amount of weight an egg loses during its incubation period. An accepted standard rate of weight loss during incubation is 15% to 18% of the egg's fresh weight. By weighing the egg every other day the hatchery operator can monitor each egg and raise or lower the incubator humidity as needed.

The percentage weight loss of an egg is easy to calculate if you get the egg fresh and weigh it, then monitor its weight loss during incubation. But what happens if the fresh egg weight is unknown or you only have one weight value for the egg on day twelve of incubation? How can this information help you? Remember in high school when you said "Why do I have to take algebra?" What possible use can I have for algebra once I get out of this place? Well, hold on to your hats for a trip down memory lane as we work through a weight loss problem.

Let's say that you have been working hard to establish a breeding program for the Cock-a-trice for several years and this year in particular it looks as if your program may come to fruition. But, as so often happens, the Cock-a-trice lays its egg while you are on vacation. You return to work and discover the egg in the incubator and a note taped to the door of the machine which says that the Cock-a-trice egg was collected and set in the incubator twelve days ago, but no weights or measurements have been taken. This egg is very important and you need its fresh egg weight in order to monitor its weight loss and ensure a successful hatch. What can you do?

There is a relationship between egg size and fresh egg weight which is expressed by the formula:

$$f = k_w l w^2$$

Where f is the unknown fresh egg weight, l is the length of the egg in centimeters, w is the width of the egg in centimeters and k_w is a constant value of 0.576 (Hoyt, 1979). Now you can take the calipers, put on the plastic gloves to protect the egg shell and immediately collect the length and width measurements and weigh the egg.

Egg Weight Loss During Incubation, Continued

The length of the nearly round Cock-a-trice egg is 5.68cm and the width is 5.10cm. In order to get the fresh egg weight, simply plug the numbers into the formula:

$$\begin{aligned}f &= kwlw^2 \\&= (0.576) 5.68 (5.10^2) \\&= (0.576) 147.74 \\&= 85.1 \text{ grams}\end{aligned}$$

If this Cock-a-trice egg weighed 85 grams on the day it was laid and it is expected to lose 15% to 18% of its weight over a 32-day incubation period, then:

$$85 \text{ grams} \times 0.15 = 12.8 \text{ grams}$$

and:

$$85 \text{ grams} \times 0.18 = 15.3 \text{ grams}$$

So, the egg should lose between 12.8 grams and 15.3 grams over 32 days, or:

$$\frac{12.8 \text{ grams}}{32 \text{ days}} = 0.4 \text{ grams/day}$$

and:

$$\frac{15.3 \text{ grams}}{32 \text{ days}} = 0.5 \text{ grams/day}$$

and we see that the egg should lose between 0.4 and 0.5 grams each day.

Let's say the weight of the egg on day 12 was 80.2 grams and the fresh egg weight, as calculated, was 85.1 grams. With these two points we can calculate the slope of the weight loss line and figure out at what percentage rate the egg has been losing weight so far.

This formula looks difficult but it makes perfect sense and is really very simple to use if you know two weights of the egg, the number of days into incubation that the second weight was taken, and the estimated incubation period. Let S = the starting weight, that is the fresh egg weight (in our case $S = 85.1$). Let E = the second weight value ($E = 80.2$). Let I = the number of days into incubation that the second weight was taken ($I = 12$). Let P = the estimated incubation period. In the case of the Cock-a-trice $P = 32$.

Our first calculation is to find out how much weight the egg lost in those 12 days of incubation so we simply subtract one weight from the other:

$$\frac{S - E}{85.1 - 80.2} = 4.9 \text{ grams}$$

Next we calculate a daily weight loss by dividing that amount by the number of days the egg has been incubated:

$$\frac{S - E}{I}$$

$$\frac{85.1 - 80.2}{12} = 0.41 \text{ grams/day}$$

Egg Weight Loss During Incubation, Continued

If we multiply that amount by the predicted incubation period we can estimate how much weight the egg will lose over the entire incubation period if it continues to lose weight at this rate:

$$\frac{S-E}{I} (P)$$

$$\frac{85.1 - 80.2}{12} (32) = 13.12 \text{ grams}$$

Divide this amount by the fresh weight of the egg and multiply the sum by 100 to arrive at the current percentage weight loss for this egg at this temperature and humidity.

$$\frac{S-E}{I} (100)$$

$$\frac{85.1 - 80.2}{12} (32) \overline{(100)} = 15.4\%$$

So it seems that the humidity in the incubator is just fine for the egg and in about 20 days a healthy Cock-a-trice should hatch.

References:

Hoyt, D.F. (1979): Practical methods of estimating volume and fresh egg weight in birds. AUK 96: 73-77.

(Author's note: I will buy a cocktail of your choice at the icebreaker in Milwaukee for the first five people who write to me and tell me what a Cock-a-trice is and why we would probably not want to breed them in captivity.)



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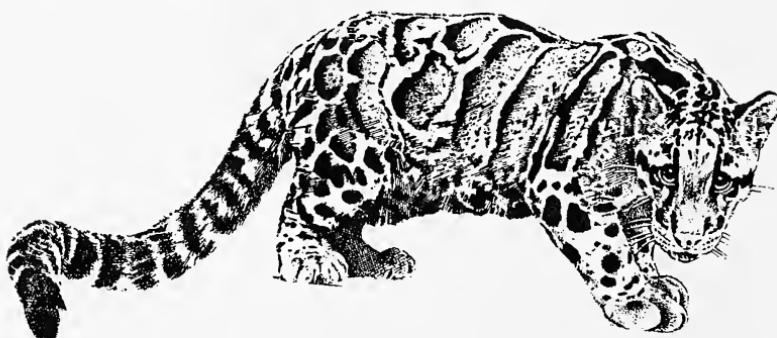
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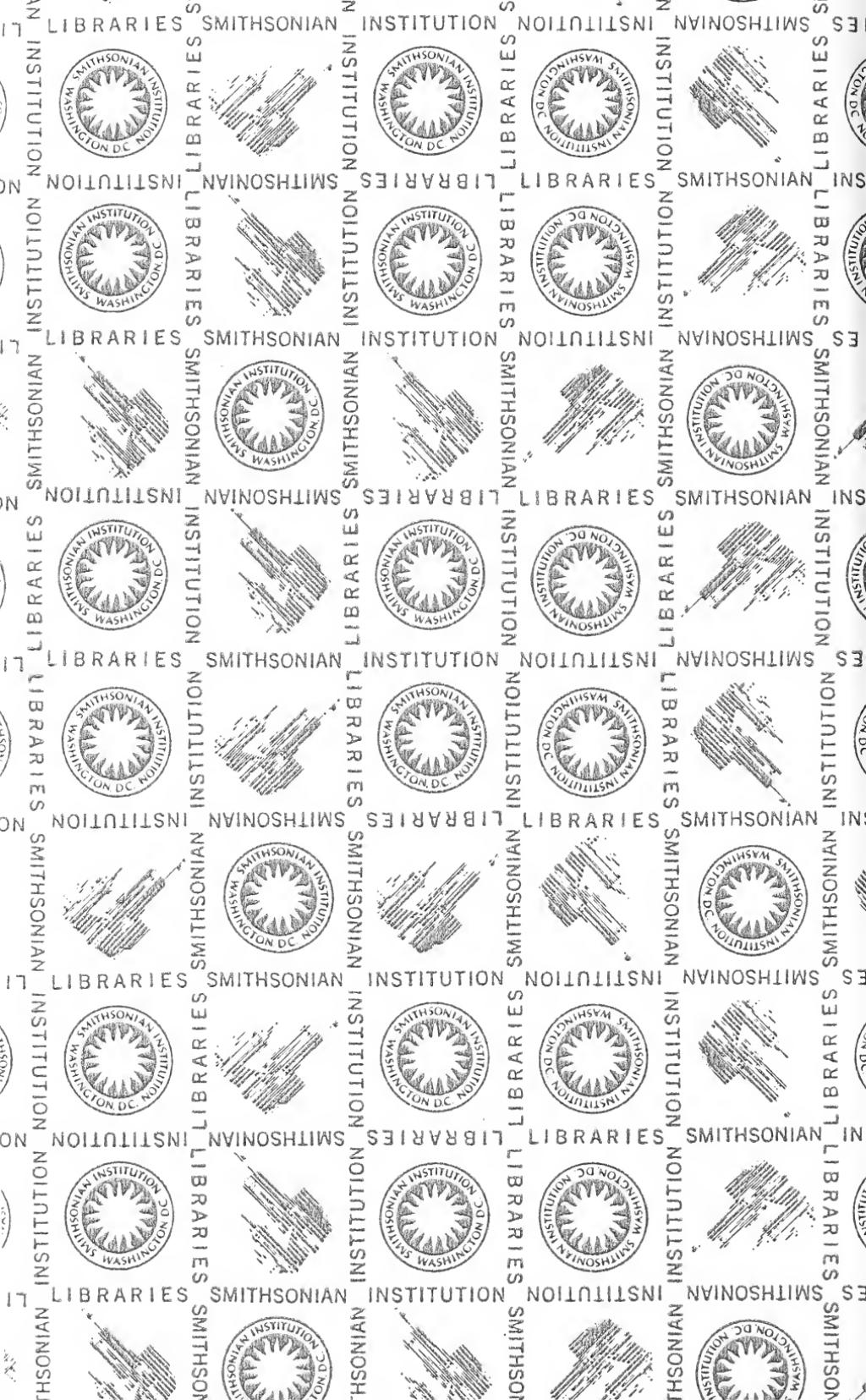
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